

DESCRIPTIONS OF SOME NEW SOUTH AMERICAN *ARCTIADAE*, WITH NOTES.

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IN the "Catalogue of the Lepidoptera Phalaenae in the British Museum" the genera *Azatrepbes*, *Gonotrepbes*, and *Antaxia* are placed among the *Syntomidae* on account of the absence of the costal nervure of the hindwing. These forms are otherwise very different from the rest of the insects contained in Volume I. of the Catalogue; and as some of the forms included in the *Arctiadae* in Volume III. show analogous venuration, I prefer to treat these three genera as aberrant *Arctiadae*, and place them as follows: *Gonotrepbes* following *Thyrarctia*, *Azatrepbes* following *Zatrepbes*, and *Antaxia* immediately after *Prumala*.

1. *Robinsonia marginata* spec. nov. (Pl. IV. fig. 1).

Nearest allied to *R. propheta* Dognin, but much larger.

♀. Head and thorax white; palpi and antennae brown; patagia with brown patch where they meet costa of forewing; dorsal surface of first six segments of abdomen orange buff with white median line, last two segments, ventral surface, and sides of abdomen white; forelegs brown, mid- and hindlegs whitish.—Forewing white with dark brown costal fascia and outer margin.—Hindwing pure white. Underside of wings as above, but costal fascia and outer margin of forewing much paler brown.

Length of forewing: 19 mm.

Hab. British Guiana (Mr. Whitford, bought by him at Georgetown, but almost certainly from Omai).

2 ♀ ♀.

2. *Robinsonia suffusa* spec. nov. (Pl. IV. fig. 3).

This species is nearest to *R. morula* Druce.

♂. Head and tegulae buff; base of patagia grey, rest white; thorax buff; abdomen above greyish brown clothed with white downy scales which give it a powdered appearance.—Forewing white, veins brownish grey, costal fascia and a broad outer margin from apex to vein 3 dark grey, as also are two broad streaks running between veins 3 and 4 and 4 and 5 halfway across the wing; inner margin grey.—Hindwing white, veins slightly washed with grey, except veins 1 and 2. Underside as above.

Length of forewing: 16 mm.

Hab. Fonte Boa, Upper Amazons, May 1906 (S. M. Klages).

2 ♂ ♂.

3. *Robinsonia multimaculata* spec. nov. (Pl. IV. fig. 5).

Nearest to *R. polyplugia* Schaus.

♂. Palpi black with white lateral patches; head white with black bar above frons, back of head scarlet; antennae brown; thorax bright brown; tegulae

and patagia white with narrow brown edges ; whitish spot in centre of metathorax ; legs deep brown, washed with yellowish white on outside ; abdomen brilliant orange with dorsal row of white dots.—Forewing rufous brown, three white points at base, an elliptical silvery-white patch below cell and running up into it, a large triangular silvery patch beyond cell, and a similar smaller patch between these two running from costa into cell ; inner margin white at base with a millimeter-long white streak under the elliptical patch, a longer white streak at outer fourth, and a white spot in centre of vein 1 ; large white patch at outer angle between veins 1 and 2, two at apex, and five between the apex and terminal part of inner margin.—Hindwing silvery white.

Length of forewing : 24 mm.

Hab. Santo Domingo, Carabaya, S.E. Peru, 6000 ft., June 1902, dry season (G. Oekenden).

4 ♂♂.

4. *Robinsonia punctata* spec. nov. (Pl. IV. fig. 6).

Closely allied to the next species and to *R. dewitzi* Gundl.

♀. Frons white, head golden yellow, palpi brown, with first joint and tip white ; thorax brown with white central streak ; tegulae and patagia white with brown margins ; pectus white, orange in front ; legs white and brown ; abdomen orange with white central line of dots and a black dot on each side of the fourth segment.—Forewing brown, a large diamond-shaped silvery-white patch in submedian interspace extending to vein 11, a second large oval patch extending from just inside apex of cell to apex and occupying almost the whole rest of wing between veins 2 and 11, a small white patch at end of 4 between inner margin and vein 2.—Hindwing silvery white.

Hab. Huatuxco, Vera Cruz.

1 ♀.

5. *Robinsonia similis* spec. nov. (Pl. IV. fig. 7).

Nearest to the last species and *R. dewitzi* Gundl.

♀. Frons and rest of head bright orange ; pectus yellow, orange in front ; antennae pale brown ; thorax pale brown with white central line ; tegulae and patagia white with pale brown edges ; abdomen orange with dorsal row of white dots and conspicuous lateral black spots on the last five segments.—Forewing brown, the two large silvery patches almost as in *R. dewitzi*, but the outer one reaches to apex ; outer margin narrow and white, inner margin joined to inner silvery patch only having an irregular angulated brown streak on it.—Hindwing white.

Length of forewing : 23 mm.

Hab. Caparo, Trinidad, November 1905 (S. M. Klages).

1 ♀.

6. *Neidalia dognini* spec. nov.

♂. Differs from *N. villacresi* Dognin in having two instead of a single transverse line and no white margins to either. The antemedian line runs obliquely from the centre of the costa to the inner margin about one-fourth from the base. The postmedian line is curved, and crosses the wing about

one-third from the apex. Colour of wings and body rufous orange-brown; under-surface paler.

♀. Orange-yellow, irrorated with scattered red dots. Transverse lines reddish, not black as in ♂; a short reddish streak at apex of cell.

Length of forewing: ♂ 18 mm.; ♀ 15 mm.

Hab. Santo Domingo and Tinguri, in Carabaya, Peru, and La Oroya, R. Inambari (G. Ockenden).

2 ♂♂, 2 ♀♀.

7. *Idalus lutescens* spec. nov. (Pl. IV. fig. 8).

Palpi black, legs yellow and brown; head, tegulae, patagia, and thorax buffy yellow; abdomen slightly darker.—Forewing yellow; hindwing buff.

Length of forewing: 20 mm.

Hab. Oconeque, Carabaya, Peru, 7000 ft., July 1904 (G. Ockenden).

1 ♂.

8. *Idalus irregularis* spec. nov. (Pl. IV. fig. 9).

Palpi buffish grey with crimson line along the outside; frons and head buff, washed strongly with crimson; tegulae and patagia greyish buff, blotched and edged with crimson; thorax similar; abdomen yellowish crimson, last segment dark buff, underside clayish buff; pectus pale crimson.—Forewing greyish brown, slightly washed with mauve; between veins 2, 3, 4, 5, and 6 are scattered a number of yellow spots, and the veins themselves have a number of short red streaks on them; between veins 8 and 9 are three yellow dots, and at the end of veins 5, 6, 7, 8, 9 is a yellow dot.—Hindwing whitish buff washed with dirty red along inner margin; large scent organ with patch of androconia, as in *I. melanopasta* Druce.

Length of forewing: 18 mm.

Hab. Fonte Boa, Amazonas, October 1906 (S. M. Klages).

2 ♂♂.

9. *Idalus simplex* spec. nov. (Pl. IV. fig. 10).

♂. Palpi, outside crimson, inside buffy grey; head yellowish grey-brown with indistinct crimson border at hind part; tegulae, patagia, and thorax yellowish grey-brown, powdered with pale crimson scales; abdomen dirty red, last and two first segments buffish, powdered with red; antennae crimson from base for about 2 mm., then clay-brown, and finally whitish for the last 3 mm.; legs and pectus crimson.—Forewing clay-brown, slightly powdered with reddish scales; costa crimson, outer margin golden yellow with a crimson line internally; large narrow patch of androconia below cell.—Hindwing buffy clay-brown, strongly washed with crimson.

Underside of forewing brownish pale crimson; hindwing as above.

♀. Similar, but apex of forewing less drawn out, and hindwing more ovate, less triangular.

Length of forewing: ♂ 16 mm., ♀ 19 mm.

Hab. Aroewarwa Creek, Maroewym Valley, Surinam, March 1905 (S. M. Klages).

5 ♂♂, 1 ♀.

10. *Idalus salmonaceus* spec. nov. (Pl. IV. fig. 11).

♂. Palpi black; head and tegulae yellow; patagia salmon-pink edged with yellow; thorax similar; abdomen salmon-pink, irrorated with yellow, last segment yellow, a black dot on fourth, fifth, sixth, and seventh segments dorsally.—Forewing salmon-pink, nervures, costal and outer margin bright yellow.—Hindwing pinkish buff, from inner margin to just beyond vein 3 salmon-pink.

Underside as above, but paler.

♀. Differs in being much darker, the salmon-pink being washed with carmine and the hindwing all rose-pink.

Length of forewing: ♂ 19 mm.; ♀ 22 mm.

Hab. Santo Domingo, Tinguri, and Rio Huacamayo, Peru, 1904-5 (G. Ockenden).

6 ♂♂, 1 ♀.

11. *Aphyle affinis* spec. nov. (Pl. IV. fig. 12).

♂. Palpi orange, head brownish orange; tegulae, patagia, and thorax dirty white, on the centre of thorax two black patches one behind the other; abdomen yellow; legs and pectus orange-buff.—Forewing: basal three-fourths dirty white, almost covered by two large patches of bright salmon-pink: apex and outer fourth pale buff; wing crossed obliquely by two rather broad black lines, the postmedian one interrupted at vein 4; costa brownish orange: from the apex to the outer margin at vein 6, reaching back into the wing 3 mm., is a broad black line, forming three parts of an ovoid.—Hindwing yellowish salmon-pink, costal area buff white.

Underside of wings orange-buff.

♀. Larger and paler.

Length of forewing: ♂ 15 mm.; ♀ 19 mm.

Hab. Fonte Boa, Upper Amazons, July 1906 (S. M. Klages); La Union, Rio Huacamayo, Carabaya, Peru, 2000 ft., November 1904 (G. Ockenden).

15 ♂♂, 3 ♀♀.

12. *Prumala indistincta* spec. nov. (Pl. IV. fig. 14).

♂. Similar to *P. suana* Drncee, but the band of ovate spots from the apex to the angle of inner margin is reduced to a line of indistinct dots, while the subapical patch is reduced to a grey dot with a reddish wash; the patch at angle of inner margin is less distinct, and has a red margin; the discal and antemedian transverse rows of spots are larger and with indistinct red rings.—Hindwing buff, washed strongly with pink; abdomen pink.

♀. Has spots on forewing almost obliterated, but has a double grey spot with reddish ring in the cell at the basal end; abdomen crimson, last segment yellow.

Hab. Sapneay, Paragnay, January 1905 (W. Foster); Chiriqui.

1 ♂, 1 ♀.

13. *Prumala submarginalis* spec. nov. (Pl. IV. fig. 16).

♂. Palpi grey, with crimson line outside; head grey, spotted with crimson; tegulae, patagia, and thorax yellow, spotted with grey and crimson; abdomen crimson above, white below.—Forewing: basal half purplish grey, running

obliquely from costa to vein 3 on outer margin, bordered exteriorly with crimson; veins crimson, a crimson dot where vein 9 springs from vein 10, a large grey diamond-shaped spot crimson-edged running from vein 9 nearly up to vein 10 beyond the cell; a submarginal row of grey red-edged spots on veins from 5 to 8, and a row of similar spots within this, largest towards costa.—Hindwing hyaline buff, washed with rose carmine; a brown marginal spot on vein 3.

Length of forewing: 14 mm.

Hab. Minas Geraes, October 1900 (A. Kennedy).

1 ♂.

14. *Prumala flavicollis* spec. nov. (Pl. IV. fig. 15).

♂. Palpi yellow, frons orange, head yellow with two grey spots; tegulae and base of patagia yellow, rest of patagia mauve brown with crimson edges; thorax brownish; abdomen crimson, tip yellow, a white dorsal spot on second segment.—Forewing dark purplish grey, fore basal two-fifths becoming paler towards inner margin, within this area vein 3 crimson; costa yellow, apical three-fifths yellow, separated from dark area by irregular crimson line running on to costa; marginal row of crimson dots, submarginal row of grey dots, followed by an irregular line; spots grey edged with crimson, expanding into large patches between vein 8 and costa; various dots on disc.—Hindwing pale crimson, costal area white.

Length of forewing: 15 mm.

Hab. Fonte Boa, Upper Amazons, May 1906 (S. M. Klages).

1 ♂.

15. *Prumala incisa* spec. nov. (Pl. IV. fig. 17).

♀. Palpi crimson, forelegs white, basal half of tibiae crimson; antennae above brown, underside crimson; head, tegulae, patagia, and thorax warm brown; abdomen crimson.—Forewing brown, slightly washed with crimson; costa pale crimson, a median and antemedian transverse zigzag line crosses the disc from subcostal vein to inner margin; outer margin from vein 2 yellow; between veins 3 and 6 this yellow area runs into the disc of the wing in a truncate-shaped patch 3 mm. wide, the whole yellow area separated from rest of wing by a crimson line.—Hindwing crimson.

Underside pale crimson, except yellow area of forewing.

Length of forewing: 16 mm.

Hab. Fonte Boa, Upper Amazons, June 1906 (S. M. Klages).

1 ♀.

16. *Prumala sordida* spec. nov. (Pl. IV. fig. 18).

♂. Palpi buff; head, tegulae, and patagia yellow-spotted and edged with dull red and grey; abdomen crimson, last five segments washed with clay-colour.—Forewing: basal two-thirds dirty clayish grey-brown; a distinct lobe protruding from inner margin about one-fourth from base; this lobe is blackish brown, and from its apex to the base of costa runs a scarlet oblique streak; outer edge of dark area bordered with scarlet, veins in this area irregularly dotted here and there with scarlet; outer third hyaline greyish buff with some indistinct lines of darker spots.—Hindwing greyish buff with pale crimson dash near base of inner margin.

Length of forewing : 14 mm.

Hab. La Union, R. Huacamayo, Carabaya, Peru, 2000 ft., November 1904 (G. Ockenden), 1 ♂ (type); Sapucay, Paraguay (W. Foster), 1 ♂.

17. *Antaxia affinis* spec. nov. (Pl. IV. fig. 20).

Nearest to *A. syriaca* (Druce) (Pl. IV. fig. 21).

♂. Palpi brick-red; legs and tibiae red and brown; tarsi yellow; thorax, abdomen, and head brownish brick-red.—Forewing: basal third brick-red, basal third of costa and broad band on outside of basal area deep reddish brown; the basal area is strongly angulated at the lower end, running out on inner margin between it and to beyond vein 2 in a broad band almost to angle of inner margin; rest of wing yellow; costa from apex towards base broadly brick-red for about $3\frac{1}{2}$ mm., curving into a hooked patch on inner side; four brick-red dots in centre of yellow area.—Hindwing yellow, broadly pale brick-colour on inner area.

Length of forewing : 15 mm.

Hab. La Union, R. Huacamayo, Carabaya, Peru, 2000 ft., December 1904 (G. Ockenden).

1 ♂.

18. *Eupseudosoma grandis* sp. nov. (Pl. IV. fig. 23).

♂. Palpi and frons grey; head and tegulae orange-buff; patagia and thorax white; abdomen crimson with white dorsal dots; basal and two last segments white.—Forewing hyaline white, costal edge brown, three or four brownish streaks on disc.—Hindwing hyaline white.

♀. Similar, but more heavily scaled on the wings.

Length of forewing: ♂ 23 mm.; ♀ 27 mm.

Hab. Santo Domingo and R. Huacamayo, Carabaya, Peru, and Caradoc, Marcapata (G. Ockenden).

1 ♂, 2 ♀♀.

19. *Eupseudosoma aberrans* Schaus (Pl. IV. fig. 24).

This species is quite distinct from *agramma*, for it has dark brown costal margins in both sexes, and the inner two-thirds of hindwing in the male pale crimson.

Hab. 2 ♂♂ from Caparo, Trinidad (S. M. Klages) and 1 ♀ from Sapucay, Paraguay, 10. i. 1905 (W. Foster).

20. *Eupseudosoma albescens* spec. nov. (Pl. IV. fig. 25).

♀. Palpi white, head dull orange, legs and antennae brownish grey; rest of body and wings pure white.

Length of forewing : 19 mm.

Hab. Aroewarwa Creek, Maroewym Valley, Surinam, April 1905 (S. M. Klages); British Guiana.

4 ♀♀.

21. *Neaxia ockendeni* spec. nov. (Pl. IV. fig. 26).

♂ Palpi dirty white, tip and a narrow line outside brown; head yellow; tegulae yellow; patagia brown, spotted with yellow; thorax brown; abdomen pale crimson, last segment and dorsal spot on second segment yellow.—Forewing

yellow, three or four brown dots and spots at base; an irregular band of large confluent brown spots crosses the wing from costa to inner margin across basal end of cell, the last but one having the centre yellow; several brown spots in and around cell and beyond it; an irregular transverse band of large brown spots reaching inner margin, where it expands into a large blotch; a marginal and submarginal row of smaller spots.—Hindwing salmon-pink.

Length of forewing: 14 mm.

Hab. Fonte Boa, Upper Amazons, May 1906 (S. M. Klages); R. Huacamayo, Carabaya, 3100 ft., June 1904 (G. Ockenden), type.

2 ♂♂.

22. *Neaxia klagesi* spec. nov. (Pl. IV. fig. 27).

♂. Palpi yellow, streaked and tipped with brown; frons, head and tegulae yellow; patagia, base yellow, rest edged with brown; thorax yellow, spotted with brown; abdomen crimson, first and last segment and dorsal spot on second yellow.—Forewing yellow, a short brown streak runs from base obliquely to vein 2; an antemedian band of large irregular brown patches runs from the costa obliquely to the inner angle, broadly interrupted on inner margin to vein 2 with a yellow patch; veins in band partly crimson; in and above cell are two brown spots and a curved row of four; beyond it a marginal row of brown spots, and between these and the curved row of four spots an irregular transverse row of brown patches and spots.—Hindwing: costal area white, rest of wing buffish grey; a large greyish brown patch occupying outer third with a long yellow patch above it.

Length of forewing: 18 mm.

Hab. Aroewarwa Creek, Maroewym Valley, Surinam, August 1905 (S. M. Klages).

2 ♂♂.

23. *Eriostepta fulvescens* spec. nov. (Pl. IV. fig. 28).

Nearest to *E. bacchans* Schans.

♂. Palpi buff with a red streak and black spot on third joint; head buff powdered with red; tegulae, patagia, and thorax buff streaked with red; abdomen dull crimson marked with buff; on each of the second and third segments is a curious scent organ filled with a large patch of androconial scales of a silvery opalescent hue.—Forewing buffy yellow; veins all edged with pale dull crimson, a marginal and submarginal transverse row of blackish spots, a post-median transverse dark grey curved line on the inside of which are six black dots; in the cell three black dots, two grey lines and a dull red spot; between the cell and the base several grey streaks and black dots, inner margin pink.—Hindwing buff with two pink streaks.

Length of forewing: 20 mm.

Hab. Fonte Boa, Upper Amazons, June 1906 (S. M. Klages); Aroewarwa Creek, Maroewym Valley, Surinam, August 1905 (S. M. Klages).

8 ♂♂.

24. *Zatrephes rosacea* spec. nov. (Pl. IV. fig. 29, 30).

♂. Palpi white, pinkish carmine outside and at tips; head carmine, irrorated with white; abdomen deep carmine with white sides to last segment, and white below; forelegs carmine; thorax and forewing pale purplish brown, strongly

irrorated with crimson; beyond cell a transverse patch of four coalescent hyaline spots and a separate hyaline dot; costa white, irrorated with carmine.—Hindwing pale carmine, fringe white.

♀. Similar, but hindwing more like forewing.

Hab. Fonte Boa, Upper Amazons, August 1907 (S. M. Klages).

11 ♂♂, 1 ♀.

25. *Zatrephes klagesi* spec. nov. (Pl. IV. fig. 31).

♂. Palpi buff; head, tegulae, patagia, and thorax buff irrorated with pink; abdomen brownish crimson, last segment and dorsal dot on second buff.—Forewing dark buff irrorated thickly with brown; costal edge white, an ante-medial transverse line from costa to inner margin brown, a black dot in cell, a postmedial transverse line from vein 7 to inner margin brown; hyaline patch placed obliquely, consisting of five coalescent spots, and bordered on the inner side with a brown line.—Hindwing crimson, costal area buffish.

Length of forewing: 15 mm.

Hab. Fonte Boa, Upper Amazons, June 1906 (S. M. Klages).

38 ♂♂.

26. *Zatrephes variegata* spec. nov. (Pl. IV. fig. 32).

♂. Palpi white, edged with carmine; head white, irrorated with pink; collar brownish; tegulae white, irrorated with pink; patagia and thorax greyish buff, irrorated with carmine and grey; abdomen crimson carmine, sides of last segment whitish.—Forewing: costa white, buffy yellow, irrorated with carmine and blotched and streaked with greenish grey; hyaline patch consists of five coalescent spots almost covered with yellow and crimson scales.—Hindwing crimson carmine; costal area white.

Length of forewing: 17 mm.

Hab. Fonte Boa, Upper Amazons, July 1907 (S. M. Klages).

12 ♂♂.

27. *Zatrephes flavipuncta* spec. nov. (Pl. IV. fig. 33).

♂. Palpi white with crimson streak; head, tegulae, and patagia rosy grey, irrorated with carmine; thorax carmine; abdomen deep carmine, sides of last segment whitish.—Forewing marve brown, irrorated with carmine and red scales; costal edge whitish, in cell orange-yellow spot with scarlet ring followed by a black dot; hyaline patch made up of five coalescent greenish-yellow spots encircled by a carmine line; at apex and between hyaline patch and outer margin two irregular patches of buffy orange, irrorated thickly with brown and carmine scales.—Hindwing rosy carmine, fringe white.

♀. Similar.

Length of forewing: ♂ 14 mm.; ♀ 16 mm.

Hab. Aroewarwa Creek, Maroewym Valley, Surinam, April 1905 (S. M. Klages).

1 ♂, 1 ♀

28. *Zatrephes irrorata* spec. nov. (Pl. IV. fig. 34).

♂. Palpi white with brown line; head, tegulae, patagia, and thorax pale brownish yellow, thickly irrorated with brown; abdomen dull carmine.—Forewing brownish buffy yellow, thickly covered with little dark brown streaks and striae;

veins 2 and 3 thickly scaled with dark brown ; no hyaline patch, but two hyaline spots at end of cell and two nearer outer margin between veins 6 and 7 ; three small blackish lunules near apex.—Hindwing brownish crimson.

Length of forewing : 16 mm.

Hab. Fonte Boa, Upper Amazonas, August 1906 (S. M. Klages).

1 ♂.

29. *Zatrephes cruciata* spec. nov. (Pl. IV. fig. 35).

♀. The only ♂ is too much rubbed to describe accurately. Palpi of ♀ whitish, with pale crimson line ; head, tegulae, patagia, and thorax pale buff, irrorated with pale crimson ; abdomen above dirty crimson, with a buff dorsal line, the last three segments much mixed with buff.—Forewing pale buff, irrorated with crimson, a black dot in cell ; costal edge white, an antemedian line from costa to inner margin brownish grey, inner margin greyish brown ; from the centre of inner margin on to the disc run two brownish grey lines 5 mm. long in the form of a X ; hyaline patch much obscured by scales runs obliquely towards outer margin, is bordered on inner side by ill-defined brownish line and shade, and consists of four spots.—Hindwing : costal half buffish, irrorated and washed with pale crimson, inner half pale crimson.

♂. Appears similar, but abdomen brighter crimson, and two-thirds of the hindwing crimson.

Length of forewing : ♀ 18 mm. ; ♂ 17 mm.

Hab. Fonte Boa, Amazonas, July 1906 and August 1907 (S. M. Klages).

1 ♀ (type), 1 ♂.

30. *Zatrephes rufescens* spec. nov.

♂. Palpi white with crimson line ; forelegs pale brown powdered with crimson, remaining legs white ; antennae, base crimson, basal third pale brown and crimson, rest brown ; head mixed crimson and brown ; tegulae, patagia, and thorax pale grey-brown, irrorated with crimson ; abdomen crimson, last segment brownish grey mixed slightly with crimson.—Forewing buffy orange, much irrorated with crimson, a black dot in cell, a dark brownish grey antemedian line from costa to inner margin ; from veins 5 and 6 to inner margin on the disc two zigzag dark brownish grey lines, and above them and surrounding the hyaline patch a large purplish brown-grey patch ; hyaline patch only slightly oblique, consisting of two large coalescent spots between veins 6 and 7 and 7 and 8, and two small ones between 8 and 9 and 9 and 10, and a small dot above not coalescent.—Hindwing buff, washed with pale crimson.

♀. Similar, but larger, and markings much less distinct ; hyaline patch with all spots much reduced ; hindwing dull crimson.

Length of forewing : ♂ 16 mm. ; ♀ 21 mm.

Hab. Fonte Boa, Amazonas, May and August 1906 and 1907 (S. M. Klages) ; Aroewarwa Creek, Maroewym Valley, Surinam, and Santo Antonio do Javary, Amazonas, May 1905 and June 1907 (S. M. Klages).

3 ♂♂, 10 ♀♀.

31. *Zatrephes ockendeni* spec. nov. (Pl. IV. fig. 36).

♂. This species is nearly allied to *Z. ossea* Schaus, but is distinguishable at once by the large hyaline patch ; palpi crimson on outside, buffy white in front ; legs whitish, powdered with crimson ; head, tegulae, and patagia pinkish

cream-colour, irrorated with crimson; thorax rufous brown; abdomen crimson, last segment whitish.—Forewing pinkish cream-colour, strongly irrorated with crimson, a black dot in the cell, a sharply defined transverse antemedian line brownish or yellowish olive, a postmedian line of same colour less defined, inner margin olive-brown; hyaline patch consists of four spots, uppermost small and round, second large and kidney-shaped, the third very large, oblong ovate, the lower small and triangular, the whole patch surrounded by a thin blackish line.—Hindwing creamy white, very strongly washed and irrorated with pale crimson.

Length of forewing: 18 mm.

Hab. La Oroya, R. Inambari, Peru, September 1904, 3100 ft. (G. Ockenden).

1 ♂.

32. *Zatrephes brunnea* spec. nov.

♂. Palpi white with crimson stripe; head, tegulae, patagia, and thorax pale brown, irrorated with pink; abdomen crimson.—Forewing pale brown, so densely covered with darker brown scales that the wing at first sight appears a uniform umber brown; it is also irrorated with crimson, a black dot in cell, and a broad median band of slightly darker shade than rest of wing crosses the wing; hyaline patch small, consists of five smallish spots, the uppermost separate.—Hindwing crimson.

♀. Paler.

Length of forewing: ♂ 18 mm.; ♀ 22 mm.

Hab. La Union, R. Huacamayo, Carabaya, Peru, 2000 ft., December 1904 (G. Ockenden).

2 ♂♂, 1 ♀.

33. *Zatrephes griseorufa* spec. nov. (Pl. IV. fig. 37).

♂. Palpi whitish with brown stripe; forelegs brown, remaining legs and pectus pure white; head, tegulae, and patagia grey, irrorated with brown; thorax grey with brownish centre; abdomen brown.—Forewing strongly truncate at apex, grey, slightly irrorated with tiny brown streaks, heavily so in the outer fourth of the wing; two (one ante- and one postmedian) transverse rather faint lines dull brown; hyaline patch consists of four spots, the upper one small, quadrate and detached, the second small, comma-shaped, the two lower ones large and oblong.—Hindwing orange rufous, costal area buff.

Length of forewing: 19 mm.

Hab. Fonte Boa, Amazonas, June 1906 (S. M. Klages).

2 ♂♂.

34. *Zatrephes binotata* spec. nov. (Pl. IV. fig. 38).

♂. Palpi and legs buffy brown; pectus pure white; head and thorax buffy brown; abdomen slightly darker.—Forewing: apical area truncate, buffy brown irrorated with crimson and greenish grey; an antemedian and a median transverse lines greenish grey; hyaline spot very small, consisting of two small spots; there is a hyaline dot on vein 9, nearer the apex.—Hindwing buff, slightly washed with orange, outer margin rufous.

Length of forewing: 17 mm.

Hab. Fonte Boa, Amazonas, May 1906 (S. M. Klages).

35. *Zatrephes bilineata* spec. nov. (Pl. IV. fig. 39).

♂. Palpi whitish; forelegs grey, rest whitish; head and thorax pinkish grey irrorated with crimson; abdomen darker.—Forewing: apical area truncate, pinkish grey irrorated with crimson; an antemedian and a postmedian transverse line very distinct greyish olive, outer one bordered on the outer side with buff; hyaline patch consisting of three median oblong spots, with two separate hyaline spots nearer the outer margin towards the apex; fringe of outer margin white.—Hindwing dark buff.

Length of forewing: 20 mm.

Hab. La Union, R. Huacamayo, Carabaya, Peru, 2000 ft., November 1904 (G. Ockenden).

1 ♂.

35A. *Zatrephes bilineata rufobrunnea* subspec. nov. (Pl. IV. fig. 40).

♂. Similar in all respects to *bilineata bilineata*, but ground-colour of forewing pinkish orange-rufous, thickly irrorated with brown and crimson.—Hindwing washed with rufous.

Length of forewing: 18 mm.

Hab. Fonte Boa, Amazonas, May 1906 (S. M. Klages).

2 ♂♂.

36. *Zatrephes foliacea* spec. nov. (Pl. IV. figs. 41—43).

♂. Palpi whitish in front, brown outside and at tip; head and thorax buff grey; abdomen more yellowish.—Forewing truncate, yellowish clay-grey, darker and somewhat irrorated with maroon between the somewhat faint ante- and postmedian transverse lines, the postmedian line bordered outside with buff; hyaline patch consisting of four spots, the three lower ones large and irregular, the upper one small and ovate, the whole surrounded by a narrow bright maroon ring; between the hyaline patch and the outer margin is a large maroon patch, somewhat irrorated, which fades away into the grey towards angle of inner margin; upper third of fringe of outer margin maroon and middle third white, rest uniform with wing ground-colour.—Hindwing bright buff, fringe rufous.

♀. Like the male but larger, and the transverse lines paler; 2 ♀♀ are brownish maroon all over the forewing, and the patch beyond the hyaline patch is deep reddish chocolate.

Length of forewing: ♂, 18.5 mm.; ♀, 22 mm.

Hab. Fonte Boa, Amazonas, July 1906 and August 1907 (S. M. Klages).

14 ♂♂, 4 ♀♀.

37. *Zatrephes subflavescens* spec. nov. (Pl. V. fig. 1).

♂. Palpi whitish; forelegs and tibiae brown, tarsi ringed brown and white; rest of legs and pectus white; antennae pale brown; head, thorax, and abdomen creamy buff irrorated with a darker greyish buff.—Forewing creamy buff, irrorated slightly on the basal half but very strongly on the outer half with greyish clayish brown; an ante- and a postmedian transverse line of same colour but darker; hyaline patch reduced to two widely separated round dots partially covered with whitish scales.—Hindwing creamy buff.

♀. Similar.

Length of forewing: ♂, 16—19 mm.; ♀, 21 mm.

Hab. Aroewarwa Creek, Maroewym Valley, Surinam, and Fonte Boa, Amazonas, April 1905 and July 1906 (S. M. Klages).

10 ♂, 1 ♀.

38. *Zatrephes gigantea* spec. nov. (Pl. V. fig. 2).

This is the largest species of the genus.

♀. Palpi white; forelegs and tibiae brown freckled with grey, rest of legs white; pectus white; head and thorax dull buff slightly irrorated with brown; abdomen buff, with a dorsal brownish tuft on the first, second and third segments. —Forewing whitish buff, becoming darker buff towards the outer margin; very indistinct antemedian and median transverse lines of a dirty yellowish olive; the whole surface of wing strongly irrorated with greyish brown; hyaline patch large and very irregular, consisting of four coalescent spots and a detached round dot; outline of wing strongly truncate and angulated. —Hindwing yellowish salmon-colour; costal area bright buff.

Length of forewing: 31 mm.

Hab. Fonte Boa, Amazonas, August 1906 (S. M. Klages).

2 ♀ ♀.

39. *Zatrephes albescens* spec. nov. (Pl. V. fig. 3).

♂. Palpi whitish in front, dull brick on outside; head pink; thorax whitish, irrorated with brick-red; abdomen similar. —Forewing: costa pinkish brick-red; an antemedian transverse line, dull yellowish olive, runs obliquely from the inner angle outwards to the costa; a postmedian line of the same colour runs from the inner margin obliquely to vein 9, where it ends in a round semi-detached blackish spot; inner margin yellowish olive. —Hindwing dull white, fringe pinkish grey; hyaline patch consists of two round spots.

♀. Similar.

Length of forewing: ♂, 16 mm.; ♀, 22 mm.

Hab. Fonte Boa, Amazonas, May 1906 (S. M. Klages).

1 ♂, 1 ♀.

40. *Zatrephes nitida* spec. nov. (Pl. V. fig. 5).

♂. Palpi, legs and antennae pink; head and tegulae pearl grey powdered with pink; patagia greyish silvery; abdomen crimson, first and last segments buff. —Forewing: basal two-thirds of costa creamy white, apical third as well as outer and inner margin yellowish pink, rest of wing opalescent silvery white, thickly irrorated with grey; antemedian and postmedian transverse lines greenish yellow.

Length of forewing: 17 mm.

Hab. Fonte Boa, Amazonas, May 1906 (S. M. Klages).

1 ♂.

41. *Zatrephes miniata* sp. nov. (Pl. V. fig. 6).

♀. Palpi whitish, bordered and tipped with red; foretibiae red, rest of legs whitish; pectus white; head cinnabar red; thorax dark grey, washed and irrorated with cinnabar red; abdomen deep brownish grey. —Forewing greyish orange-brown, so closely irrorated with cinnabar as to appear almost entirely red; an antemedian and a median transverse line dark grey; hyaline patch large and

consisting of three closely coalescing spots surrounded by a greyish brown cloud.
—Hindwing dark sooty grey.

♂. Identical.

Length of forewing : 19 mm.

Hab. Fonte Boa, Amazonas, June 1906 (S. M. Klages).

1 ♂, 1 ♀.

42. *Zatrephes sublutescens* spec. nov. (Pl. V. fig. 7).

♂. Palpi whitish in front, dull carmine outside; forelegs dull carmine, variegated with yellowish grey; head brownish grey, powdered with carmine; thorax and abdomen yellowish buff, slightly irrorated with carmine.—Forewing greenish buff, dusted with carmine; an antemedian and postmedian transverse line olive; beyond postmedian line are two black dots, one between veins 7 and 8 and one between 8 and 9.—Hindwing whitish buff.

♀. Identical but larger.

Length of forewing : ♂ 20 mm.; ♀ 27 mm.

Hab. La Oroya, R. Inambari, Peru, 3100 ft., October 1904 (G. Ockenden).

5 ♂♂, 1 ♀.

43. *Azatrephes fuliginosa* spec. nov. (Pl. V. figs. 8–12).

♂. Palpi brown; forelegs red and grey, inside brown; head brown; tegulae white; patagia brown, with mixed buff and red spots; abdomen brown, with white dorsal patch on second and dull orange one on third and fourth.—Forewing sooty brown, two-thirds of disc occupied by a yellowish hyaline patch with three rows of minute brown dots on it; on its outer side it is bordered by a serpentine line of silver spots which join an outer marginal row of reddish pink ones at vein 3; between the discal hyaline patch and the base is an irregular large patch, extending transversely across the wings, of bright silver intermixed with crimson streaks.—Hindwing sooty brown.

This appears to be the normal type, as five out of my eleven specimens are about like it; but from this type the species varies so much that in one direction the extreme is reached in a specimen in which the whole forewing is sooty brown, only having two or three silver and red dots on the inner margin, the much reduced line of silver spots which joins the outer marginal line of pink spots, and a few pink spots on the costa; in the opposite direction a specimen has hardly any brown on the forewing and dirty orange hindwing washed with sooty brown.

Length of forewing : 14 mm.

Hab. Fonte Boa, Amazonas, May 1906 and July and August 1907 (S. M. Klages).

11 ♂♂.

44. *Azatrephes discalis* Walker (Pl. V. fig. 14).

This is a good species, much larger than *paradisca* Butler (Pl. V. fig. 13); silvery white, not silvery yellow; has costa, outer margin, and oblique median band dull chestnut-brown instead of sooty brown and orange.

Expanse of ♂ 32 mm., of *paradisca* ♂ 25 mm.; of ♀ 39 mm., of *paradisca* ♀ 28 mm.

A. discalis also has a silvery white abdomen in the female and washed with buff in the male, while *paradisca* has a crimson abdomen in both sexes.

45. *Amaxia affinis* spec. nov. (Pl. V. fig. 15).

♂. Nearest to *A. pulchra* spec. nov. (*infra*).

Palpi yellow, spotted and striped with crimson; legs yellow; peetus crimson; head yellow, collar crimson; tegulae yellow; patagia brown edged with crimson; thorax brown; abdomen dull crimson, yellowish at last two segments.—Forewing: basal two-fifths obliquely brown with a yellow wedge near base edged with crimson, reaching from vein 5 to costa; brown area outwardly edged with crimson; pinky white patch at base of inner margin; outer three-fifths of wing yellow; along outer margin a marginal and a submarginal row of brown dots; eight other similar dots scattered on disc, and three larger oval coalescent brown spots between veins 8 and 9, 9 and 10, and 10 and 11, each with a crimson ring.—Hindwing pinkish white.

Length of forewing: 20—23 mm.

Hab. Santo Domingo, Carabaya, Peru, 6000 ft., November 1901 (G. Ockenden).

23 ♂♂.

46. *Amaxia pulchra* spec. nov. (Pl. V. fig. 16).

♂. Palpi yellow; legs yellow with three crimson rings; head red and yellow, collar crimson; tegulae yellow; patagia, outer half yellow, inner half dark brownish grey, separated from the yellow by a crimson line; abdomen crimson yellow at last segment.—Forewing: base yellow with three scarlet rings on it; a large irregular blackish patch occupying one-fourth of the wing follows this yellow basal area; at the inner margin it reaches the angle, but on costa near base of cell it is quite narrow; a yellow spot in this patch on inner margin; a marginal and submarginal row of pinkish brown spots and six similar ones on disc; before apex three large blackish oval spots encircled with scarlet; between these and patch reaching angle of inner margin four pinkish brown spots.—Hindwing earmine pink, outer margin yellowish, costal area pinkish buff.

Length of forewing: 17—22 mm.

Hab. Santo Domingo and La Oroya, R. Inambari, Carabaya, Peru, January 1901, October 1902, January 1903 (G. Ockenden); Minas Geraes (A. Kennedy).

14 ♂♂.

47. *Amaxia pardalis parva* subspec. nov. (Pl. V. fig. 17).

♂. This is the representative of the Central American *pardalis* (Pl. V. fig. 18) in the Guianas and Brazil. Similar to *pardalis pardalis*, but smaller. The yellow is duller and the hindwing less rosy, more salmon-pink; the dark colour in the basal area of forewing paler and the irregular blotch beyond the cell less oblique and less irregular in outline; abdomen dull crimson mixed with yellow.

Length of forewing in *pardalis pardalis*, ♂ 18 mm.; in *pardalis parva*, ♂ 13—15 mm.

Hab. Aroewarwa Creek, Maroewym Valley, Surinam, April 1905 (S. M. Klages); Manaos, September 1906 (M. de Mathan).

12 ♂♂, 1 ♀.

48. *Amaxia rufobasalis* spec. nov. (Pl. V. fig. 19).

♂. Palpi, legs, and frons yellow; crimson line on vertex; collar and tegulae yellow; base of patagia and front of thorax crimson; rest of patagia and thorax dark crushed-strawberry red; abdomen dull crimson, sides of last

segment whitish.—Forewing: basal third crushed strawberry washed with grey outwardly, veins in this area crimson; basal fourth of costa bright yellow, rest duller, the outer third to apex dotted with crimson; rest of wing semi-transparent dull yellow; an outer submarginal row of greyish mauve dots and ten ocellated greyish mauve spots on the disc.—Hindwing: costal third opalescent pinkish white, rest crushed strawberry.

Length of forewing: 18 mm.

Hab. Fonte Boa, Amazonas, May 1906 (S. M. Klages).

9 ♂♂.

49. *Areomolis basalis* spec. nov. (Pl. V. figs. 20, 21).

♂. Palpi greyish brown; pectus orange-buff; legs orange-buff, streaked with brownish grey and crimson; frons crimson; head yellow, marked with crimson; tegulae, patagia, and thorax streaked and irrorated with yellow, grey, and crimson; abdomen orange buffy yellow with central dorsal row of crimson spots.—Forewing greyish rufous brown, basal third more yellowish, this basal third crossed by two bright yellow and four crimson zigzag transverse lines; near the outer margin between veins 3 and 4 and 4 and 5 are two coalescent yellow spots with crimson rings.—Hindwing: basal half buff, outer half blackish.

♀. Similar, but wings broader, and the submarginal spots between veins 3 and 5 are three in number.

Length of forewing: ♂ 16 mm.; ♀ 15 mm.

Hab. Fonte Boa, Amazonas, May 1906 (S. M. Klages).

9 ♂♂, 3 ♀♀.

50. *Areomolis alboapicalis* spec. nov. (Pl. VII. fig. 29).

♂. Palpi, legs, head, thorax, and forewings deep brown; a large white spot at apex.—Hindwing deep salmon, outer margin brown; abdomen dull crimson, last three segments sooty brown.

Expanse: 31 mm.

Hab. Aroewarwa Creek, Maroewym Valley, Surinam, March 1905 (S. M. Klages).

1 ♂.

51. *Areomolis griseata* spec. nov. (Pl. V. fig. 22).

♂. Palpi, pectus, and legs grey; head grey; two orange spots behind base of antennae; tegulae grey with buffy yellow edges; patagia grey; thorax grey with central whitish line; abdomen above grey, with segments 6, 7, and 8 yellow.—Forewing dark mouse-grey with veins picked out in pale whitish grey; from costa to vein 2 a transverse line of whitish spots crosses cell, and beyond it a second line of five spots curves in and joins the first line.—Hindwing whitish grey, getting darker towards the outer margin.

Length of forewing: 14 mm.

Hab. Fonte Boa, Amazonas, May 1906 (S. M. Klages).

1 ♂.

52. *Areomolis ockendeni* spec. nov. (Pl. V. figs. 23, 24).

♂. Palpi reddish brown; pectus orange-buff; legs orange-buff striped with greyish brown; head whitish, collar crimson; tegulae and patagia brown; thorax whitish with crimson lines; abdomen brownish orange-buff with crimson rings.—

Forewing deep greyish rufous brown; near base a zigzag transverse white line edged with crimson; a similar line from costa across the cell; near outer margin between veins 2 and 5 three white spots encircled with crimson; cilia chequered with pinkish white and brown.—Hindwing buffy yellow with a wide blackish border, widest at apex and gradually narrowing till it fades away at anal angle.

Hab. La Oroya, Inambari R., Carabaya, Peru, 3100 ft., November and December 1905 (G. R. Ockenden); Aroewarwa Creek, Maroewyn Valley, Surinam, July 1905; and Fonte Boa, Amazonas, July 1906 (S. M. Klages).

53. *Parevia maculata* spec. nov. (Pl. V. fig. 25).

♀. Palpi and legs greyish yellow; head yellow; thorax yellowish grey-brown; abdomen dull crimson.—Forewing yellowish grey-brown, antemedian and median irregular semihyaline white band from costa to vein 3, edged narrowly with reddish; an apical and four other marginal and submarginal whitish semihyaline spots edged with red; a round yellow dot on inner margin one-third from the base.—Hindwing dull crimson with wide sooty brown border.

Length of forewing: 14 mm.

Hab. Fonte Boa, Amazonas, August 1907 (S. M. Klages).

1 ♀.

54. *Automolis albescens* spec. nov. (Pl. V. fig. 26).

♀. This is the largest species of the genus, for whereas *A. grandis* and *A. flammeus* have an expanse of 85 mm. this specimen has a total expanse of 95 mm.

Palpi clay-brown; pectus white; foreleg, tibia, and tarsus clay-brown, rest of leg crimson; frons white; summit of head crimson; thorax and abdomen dirty yellowish grey-white; antennae black.—Forewing dirty yellowish grey-white; hindwing semihyaline white.

Length of forewing: 44 mm.

Hab. British Guiana (bought at Georgetown by Mr. Whitford).

1 ♀.

55. *Automolis favillacea* spec. nov. (Pl. V. fig. 28).

♀. Palpi and legs brownish grey; pectus greyish buff; head and thorax pale wood-brown; abdomen sooty brown, sides of first two and whole of anal segment whitish grey.—Forewing fawn drab, strongly washed with wood-brown, deepest in subbasal area and cell, where it forms a semi-obiterated transverse band and a patch respectively; at apex and just before angle of inner margin is respectively a dark brown patch joined by a submarginal row of brown dots; from the patch before the angle of inner margin there runs also to the costa a postmedian transverse line of larger brown dots.—Hindwing: costal area whitish, rest of wing brownish mouse-grey.

Length of forewing: 22 mm.

Hab. Aroewarwa Creek, Maroewyn Valley, Surinam, August 1905 (S. M. Klages).

1 ♀.

56. *Automolis ochracea* spec. nov. (Pl. V. fig. 29).

♂. Similar to *A. ochreata* Schaus (Pl. V. fig. 30), but larger subbasal band of grey dashes more oblique, and the one that crosses the end of cell instead of being straight or slightly oblique is deeply concave.—Hindwing has costal margin straight, and shows no trace of the large scent gland and patch of androconia so conspicuous in *ochreata*.

♀. Larger.

Length of forewing: ♂ 18 mm.; ♀ 20 mm.

Hab. Santo Domingo, Carabaya, S.E. Peru, 6000 ft., June 1901; and La Oroya, R. Inambari, Peru, 3100 ft., September 1904 (G. Ockenden).

4 ♂♂, 4 ♀♀.

57. *Automolis metacrinis* spec. nov. (Pl. V. fig. 27).

♂. This species is intermediate between *crinis* and *herois*. Legs and palpi grey-brown; head whitish; tegulae, patagia, and thorax whitish, strongly washed and edged with crimson carmine; abdomen carmine, tip whitish.—Forewing hyaline opalescent white, at the base a number of longitudinal brownish grey streaks forming a subbasal band; this band is followed by a patch of pale yellow and then an almost straight transverse median band of blackish grey dashes, with more or less pale interspaces and veins.—Hindwing white, washed with pale carmine.

Length of forewing: ♂ 20 mm.; ♀ 22 mm.

Hab. Onaca, Sta. Marta, 2000 ft. (Engelke); Paramba, Ecuador, January to May 1897 (Rosenberg); S. Javier, R. Cachabi, and R. Cayapas, N.W. Ecuador (Flemming & Miquetta).

1 ♂, 3 ♀♀.

58. *Automolis fasciipuncta* spec. nov. (Pl. V. fig. 31).

♂. Palpi and legs whitish; head and tegulae and forepart of patagia and thorax buff, hindpart whitish; abdomen buff, first and last rings white.—Forewing: basal third white, rest hyaline opalescent white; from costa to inner margin across cell a band of black dots and dashes, twelve in number; two faint subbasal black dots.

Length of forewing: ♂ 20 mm.; ♀ 22 mm.

Hab. La Union, R. Huacamayo, Carabaya, Peru, November 1904 (G. Ockenden); La Oroya, R. Inambari, Peru, November—December 1905 (G. Ockenden); Fonte Boa, Amazonas, September 1906 (S. M. Klages).

3 ♂♂, 1 ♀.

59. *Automolis nigropunctata* spec. nov. (Pl. V. fig. 32).

♂. Palpi white; forelegs brown; head, tegulae, and patagia buff; thorax and abdomen white.—Forewing: edge of costa brownish black; a brownish black dot on vein on lower side of cell, a round blackish spot between veins 8 and 9 near outer margin, three blackish streaks above inner margin on disc between veins 1 and 4.—Hindwing white.

Length of forewing: 24 mm.

Hab. Fonte Boa, Amazonas, May 1906 (S. M. Klages).

1 ♂.

60. *Automolis bicolor* spec. nov. (Pl. V. figs. 34, 35).

♂. Legs and palpi grey; pectus crimson; head buff; thorax white, with crimson spot; abdomen crimson, tip whitish.—Fore- and hindwings white, slightly washed with yellow; at the end of cell in forewing two or three faint blackish streaks.

Length of forewing: ♂ 17 mm.; ♀ 20 mm.

Hab. Valencia, Venezuela; Onaca, Sta. Marta, 2000 ft. (Engelke).

61. *Automolis aureogrisea* spec. nov. (Pl. V. fig. 36).

♂. Palpi whitish yellow; legs yellow and black; head and thorax golden yellow, with dark steel-grey patch where it joins abdomen; abdomen orange-yellow, washed with grey.—Forewing deep golden yellow, with large ovate steel-grey patch, with blue reflections reaching from inner margin to beyond cell and from outer margin to within 2 mm. of base; a yellow splash runs into this from central third of inner margin.—Hindwing opalescent yellowish grey, washed with greyish brown, strongest towards outer margin.

Length of forewing: 18 mm.

Hab. Santo Domingo, Carabaya, Peru, June 1901 (G. Ockenden).

2 ♂♂.

62. *Automolis prumaloides* spec. nov. (Pl. V. fig. 38).

♂. Palpi white; legs white; head and thorax fawny olive-brown; abdomen crimson.—Forewing: costa pale fawny olive-brown, with golden splash in the centre; the basal half of wing obliquely fawny olive-brown; apical half hyaline yellow; in the apical half the veins inwards from outer margin for about a millimetre blackish brown, vein 10 almost entirely dark.—Hindwing salmon-crimson.

♀. Similar.

Length of forewing: ♂ 14 mm.; ♀ 14 mm.

Hab. Fonte Boa, Amazonas, May 1906 (S. M. Klages).

1 ♂, 1 ♀.

63. *Automolis cruenta* spec. nov. (Pl. V. fig. 39).

♂. Palpi, legs, head, thorax, and abdomen geranium-red.—Forewing scarlet, densely irrorated with rose-carmine; at end of cell is a round semihyaline white spot about $1\frac{1}{2}$ mm. across; basal half of costa slate-blue; from the inner margin to vein 8 runs a transverse median band of slate-blue which curves round the top of the white spot and runs longitudinally to join the slaty fringe of outer margin; from the base runs an indistinct slate-blue band which joins the median one at inner margin.—Hindwing pale rosy carmine, costal and outer margins bright carmine.

Length of forewing: 18 mm.

Hab. La Union, R. Huacamay, Carabaya, Peru, 2000 ft., December 1904 (G. Ockenden); Fonte Boa, Amazonas, May 1906 (S. M. Klages).

4 ♂♂.

64. *Automolis pseudidalus* spec. nov. (Pl. VI. fig. 14).

♀. Palpi and legs pale salmon-colour; head scarlet; tegulae yellow; patagia and thorax yellow, streaked with orange-chrome; abdomen salmon-colour, last two segments yellow.—Forewing bright yellow, a hyaline spot in cell surrounded by a number of ill-defined brownish grey blotches; costa strongly washed and tessellated with greyish mauve-brown; fringe of outer margin mauve-brown; wing crossed by six transverse vermiculated bands of varying breadth of a reddish orange, the outer three consisting of more or less perfect half-moons, between the fourth and fifth a line of mauve-grey spots.—Hindwing: costal third yellowish buff, rest salmon-colour.

Length of forewing: 30 mm.

Hab. Fonte Boa, Amazonas, July 1907 (S. M. Klages).

1 ♀.

65. *Automolis propinqua* spec. nov. (Pl. VI. fig. 2).

♂. Palpi, pectus, middle and hindlegs yellowish white; forelegs, head, and thorax vermilion, slightly irrorated with yellow; abdomen pale crimson.—Forewing buffy orange, irrorated with crimson and banded with leaden grey, much as in *A. crocos*. The most pronounced difference is in the hyaline yellow patch, which is larger and much wider than in *A. crocos*, but does not reach the outer margin as in that species.—Hindwing hyaline buff washed with salmon-crimson, not crimson as in *crocos*.

Length of forewing: 22 mm.

Hab. R. Huacamayo, Carabaya, Peru, June 1904 (G. Ockenden).

1 ♂.

66. *Automolis apiciplaga* spec. nov. (Pl. VI. fig. 3).

♀. Palpi, tibiae of forelegs, head, thorax, and abdomen crimson scarlet.—Forewing: basal three-fifths obliquely crimson scarlet, strongly washed with greyish mauve; apical two-fifths yellow with large apical patch of crimson scarlet washed with greyish mauve.—Hindwing paler crimson scarlet.

Length of forewing: 17 mm.

Hab. Fonte Boa, Amazonas, November 1906 (S. M. Klages).

1 ♀.

67. *Automolis flavonotata* spec. nov. (Pl. VI. fig. 4).

♀. Palpi pale brick-red; forelegs, tarsi yellow, rest crimson; head and thorax yellow, almost covered with crimson irrorations; abdomen pale crimson, with yellowish dorsal median line.—Forewing: basal half obliquely rosy magenta; near the base from the costa half across the wing a large yellow patch slightly irrorated with crimson; from the inner margin beyond this to within the cell a large wedge-shaped yellow patch almost hidden by scarlet irrorations; apical half yellow, dotted sparingly with rose dots, a subapical long narrow patch of rosy magenta edged with crimson.—Hindwing pale carmine with yellowish margin.

Length of forewing: 18 mm.

Hab. San Antonio do Javary, Amazonas, June 1907 (S. M. Klages).

1 ♀.

68. *Automolis carmesina* spec. nov. (Pl. VI. figs. 5, 6).

♂. Palpi yellowish, bordered with crimson; pectus white; forelegs crimson, rest of legs white; tarsi and tibiae tipped with brick-red; head and thorax crimson, irrorated with yellow; abdomen and hindwing dull crimson.—Forewing greyish crimson-scarlet, banded transversely with four irregular bands of orange and scarlet irrorations, hyaline patch of three spots surrounded by scarlet crimson line.

♀ similar and larger, but the hyaline patch smaller, consisting of two spots only, and the transverse bands more distinct.

Length of forewing: ♂ 19 mm.; ♀ 25 mm.

Hab. Fonte Boa, Amazonas, July 1906 (S. M. Klages).

69. *Automolis pseudopraemolis* spec. nov. (Pl. VI. fig. 1).

♂. Palpi and head blood-red; tegulae yellow edged with brick-red; patagia, thorax, and abdomen orange, washed and irrorated with mauve-grey; sides of two middle segments of abdomen dull crimson.—Forewing: costa brick-red marked with dull mauve and buffy orange; basal third very obliquely dull pinkish mauve with some half obliterated yellow patches irrorated with scarlet; on the oblique outer border of this basal third is a bright blood-red band from costa to vein 3; near apex a dull brick-red streak runs obliquely from costa halfway to outer margin; outer two-thirds of wing yellow.—Hindwing yellowish buff, strongly washed with pale crimson.

Length of forewing: 22 mm.

Hab. La Oroya, R. Inambari, Peru, September 1904 (G. Ockenden).

3 ♂♂.

70. *Automolis luteorosea* spec. nov. (Pl. V. fig. 40).

♀. Palpi grey and white; pectus yellow; legs grey; head orange; tegulae white; patagia and thorax buffy yellow; abdomen dull crimson.—Forewing buffy yellow crossed by two broad bands composed of maroon brownish grey longitudinal patches; the subbasal one oblique, the postmedian straight and very broad, between the bands white, with a yellow patch within the white.—Hindwing dull crimson.

Length of forewing: 16 mm.

Hab. Christianeburg, British Guiana.

1 ♀.

71. *Automolis ockendeni* spec. nov. (Pl. V. fig. 41).

♂♀. Palpi, head, thorax, abdomen and forewing deep velvety black, across the latter runs an oblique golden buff band from middle of costa almost to angle of inner margin.—Hindwing, costal two-fifths pearl-grey, outer three-fifths deep black.

Hab. La Oroya, R. Inambari, Peru, September 1904 (G. Ockenden).

7 ♂♂.

71A. *Automolis ockendeni lativitta* subsp. nov. (Pl. V. fig. 42).

♂. Differs from *ockendeni ockendeni* by having shorter forewing and the oblique band much darker, more orange buff, and one-third wider.

Hab. Fonte Boa, Amazonas, July 1907 (S. M. Klages).

4 ♂♂.

72. *Automolis subflammans* spec. nov. (Pl. VI. fig. 11).

♂. Differs from *flammans* by its much broader and blunter wings and duller colour.—Forewing dull ferruginous brown; only four instead of six white submarginal spots at outer margin, hyaline patch yellowish, much smaller, and made up of four, not six spots.—Hindwing reddish salmon, a hyaline white patch of two spots in centre; antennae much more strongly pectinated.

Length of forewing: 29 mm.

Hab. Sta Catharina, Brazil; Bogota.

2 ♂♂.

73. *Automolis subtruncata* spec. nov. (Pl. VI. fig. 12).

♀. Similar to ♀ of *A. pandiona*, but forewing less truncate.

Legs, palpi, head, and thorax buffy greyish cinnamon; abdomen buffish, pale crimson dorsally.—Forewing cinnamon brown, a yellow dot at base; basal half with three irregular rows of yellow spots; a postmedian discal row of two hyaline ovate spots with above and below a hyaline dot; between apex and vein 8 a yellow patch with veins brown; on each side of vein 7 two yellow submarginal spots and a yellow streak after vein 7.—Hindwing: costal half buffish, outer half pale crimson.

Length of forewing: 27 mm.

Hab. Sta. Catharina, Brazil.

1 ♀.

74. *Automolis hyalina* spec. nov. (Pl. V. fig. 33).

♂. Palpi, forelegs, and head black; collar, thorax, and abdomen golden orange.—Forewing smoky hyaline, clearer in apical third; a curved sooty grey semihyaline transverse line crosses wing one-third from outer margin; basal third golden orange, from middle of costa runs obliquely towards base a broad hyaline steel-blue band ending near base at vein 1 in a point.—Hindwing hyaline; inner margin broadly golden, a black patch 4.5 mm. long and 3 mm. wide near anal angle.

♀. Similar, but hindwing all buff, and in place of black patch cilia brown.

Length of forewing: ♂ 19 mm.; ♀ 17 mm.

Hab. La Oroya, Carabaya, Peru, 6000 ft., July 1904 (G. Ockenden); Colombia (A. E. Pratt).

6 ♂♂, 1 ♀.

75. *Automolis griseipennis* spec. nov. (Pl. VI. figs. 7, 8).

♂. Palpi and legs sooty grey; frons shining blue; head and thorax dark grey, a metallic blue dot at base of each antenna; abdomen, basal four segments reddish orange or lemon-yellow, anal five segments sooty black with a central and two lateral lines of metallic blue spots.—Forewing brownish grey, outer half obliquely much paler, separated from basal half by an ill-defined yellowish grey line.—Hindwing brownish grey with an orange-buff scent gland near base.

♀. Similar, but larger, and the two halves of forewing less sharply separated in shade of grey.

Length of forewing: ♂ 21 mm.; ♀ 25 mm.

Hab. Fonte Boa, Amazonas, July 1906 (S. M. Klages).

8 ♂♂, 2 ♀♀

76. *Automolis docis* Hübner (Pl. VII. figs. 30-41).

I have 13 ♂♂ and 6 ♀♀ of this species from between Itaituba and Obidos, January—April 1906 (W. Hoffmans); Obidos, Amazonas, October—November 1904 (M. de Mathan); Fonte Boa, Amazonas, 1906—1907 (S. M. Klages); and San Antonio do Javary, Amazonas, May 1907 (S. M. Klages). These specimens show a very great variation quite irrespective of locality. The one extreme is deep grey, with the patagia edged with dull red, and the basal two segments of the abdomen cinnabar red, the red line on forewing hardly defined, and hindwing uniform grey with orange scent spot; the other extreme has the tegulae, patagia and thorax orange scarlet, edged with dull black, first two segments of abdomen orange scarlet, forewing orange scarlet edged with black, and hindwing orange rose, broadly bordered with black.

77. *Automolis niveomaculata* spec. nov. (Pl. VI. fig. 21).

♂. Similar to *A. albiplaga* (Pl. VI. fig. 20), but much larger. Total expanse: *albiplaga*, 35 mm.; *niveomaculata*, 45 mm.

Differs from *albiplaga* in having the palpi black instead of white; the patagia sooty grey, with a central white stripe instead of an indistinct greyish white line, and the terminal third white as in *albiplaga*; abdomen has only two yellow lateral patches, one on each side of the segments 8 and 9, not five as in *albiplaga*, on each side of segments 5 to 9.—Forewing: basal two-thirds have the veins distinctly and broadly pure white, not faintly indicated in paler grey as in *albiplaga*; postmedian ovate white patch purer white and much larger, occupying fully one-fourth of the wing area.—Hindwing: the disc is much more extended white, which colour also is more sharply defined from the ground-colour of the wing; apex of wing much more produced, which gives it a much more triangular shape than in *albiplaga*.

Length of forewing: 20 mm.

Hab. La Union, R. Huacamayo, Carabaya, Peru, November 1904 (G. Oekenden).

1 ♂.

78. *Automolis uniformis* spec. nov. (Pl. VI. fig. 26).

♂. Palpi and legs brownish grey; head and collar orange; tegulae brownish grey, with faint white edging on inner side; patagia and thorax brownish grey; abdomen sooty, last segment brownish grey, three lateral yellow patches on each side of segments 6, 7, and 8.—Forewing brownish olive-grey; veins olive-buff.—Hindwing sooty black, with central area of disc whitish grey.

Length of forewing: 18 mm.

Hab. Aroewarwa Creek, Maroewyn Valley, Surinam, April 1905 (S. M. Klages).

1 ♂.

79. *Automolis klagesi* spec. nov. (Pl. V. fig. 43).

♂. Palpi and legs brownish grey, striped longitudinally with white; head black, edged with white; collar orange; tegulae, patagia, and thorax brownish black, slightly edged with olive-buff; abdomen brownish blue-black, with five lateral orange-yellow patches on each side of segments 3 to 7.—Forewing velvety brownish black; veins in basal two-thirds olive-buff; a postmedian

oblique band of buffish yellow from the costa to angle of inner margin, narrower behind.—Hindwing brownish sooty black, centre greyish white.

Length of forewing : 18 mm.

Hab. Fonte Boa, Amazonas, May 1906 (S. M. Klages).

1 ♂.

80. *Automolis godmani* Druce.

This is a distinct species, and **not** the ♀ of *rutilus*, which has a ♀ similar to the ♂.

81. *Automolis cingulata* spec. nov. (Pl. VI. fig. 24).

♀. Differs from ♀ of *rutilus* in having entirely black hindwings and a broad yellow abdominal belt formed by the sixth and seventh segments being entirely yellow.

Length of forewing : 21 mm.

Hab. Quevedo, W. Ecuador (v. Buchwald).

2 ♀ ♀.

82. *Automolis sypilus* Cram.

Sir George Hampson says (*Cat. Lep. Phal. Brit. Mus.* vol. iii. p. 57) that this species was unknown to him, and that it might be the ♀ of *pachardi* or drawn from a rubbed specimen. I have 5 ♂♂ and 1 ♀. These specimens are in perfect condition, and the ♀ exactly agrees with Cramer's figure. The ♂ much resembles *Prumala saturata* Walk., but there are two lateral yellow patches nearly meeting dorsally, one on each side of the third segment of the abdomen, instead of the basal half of abdomen being yellow, and the longitudinal central orange band of forewing is reduced to three widely separated orange streaks.

83. *Automolis pseudameoides* spec. nov.

♂. This species resembles *Prumala ameoides*. Palpi and legs brownish black, streaked longitudinally with yellowish white; head and collar white; tegulae golden yellow, broadly edged on inner side with black; patagia golden yellow; thorax golden yellow, with central black line; abdomen velvety black, yellow on sides of first two segments, and having white streaks on last four segments.—Forewing: costal edge and vein 11 buff, rest of wing black; from base to angle of inner margin placed obliquely is a large diamond-shaped golden yellow patch occupying one-third of the wing area; in the apical half of the wing is another large golden yellow irregularly triangular patch, and between the two from the outer margin to edge of cell runs a narrow buff line.—Hindwing yellowish buff, with a broad band of sooty brownish reaching from anal angle to middle of outer margin; costal third of the wing occupied by an enormous scent gland and patch of androconia.

♀. Similar, but sooty brown; abdomen above and on sides entirely deep brown glossed with blue, and merely a few whitish scales near tip; the two golden yellow patches on forewing smaller; veins whitish.—Hindwing deep sooty brown; basal third yellow.

Length of forewing : ♂ 19 mm. ; ♀ 21 mm.

Hab. La Union, R. Huacamayo, Carabaya, Peru, November 1904 (G. Ockenden).

7 ♂♂, 2 ♀♀.

84. *Automolis asara* Druce.

This is a very distinct species, not at all identical with *flavescens* Walk.

85. *Automolis superba* Druce.

This is distinct from *salma* Druce.

86. *Automolis salma* Druce.

This is quite distinct from the preceding.

87. *Automolis luteola* spec. nov. (Pl. VI. fig. 9).

♂. Allied to *bonoro* Schaus, but pectus deep buff, not black, with two white spots; head, thorax, and basal half of abdomen orange buff; apical half of abdomen black, with three rows of glittering blue spots.—Fore- and hindwings golden buff.

♀. Similar, but wings orange-buff.

Length of forewing: ♂ 19 mm.; ♀ 21 mm.

Hab. Patao Guiria, August 1891; Cúcuta, Venezuela; Patino Cúé, Paragnay, February (Montforts); Sapucay, Paragnay, July 14, 1902 (W. Forster).

3 ♂♂, 2 ♀.

88. *Automolis garleppi inversa* subspec. nov. (Pl. VI. fig. 17).

♂. Similar to *garleppi garleppi* (Pl. VI. fig. 18), but the large fuscous patch near angle of inner margin (tornus) reduced to an oval streak, while the three yellow costal patches are much larger.

Hab. Santo Domingo, Carabaya, Peru, November 1901 (G. Ockenden).

5 ♂♂ (13 ♂♂ of *garleppi garleppi* in Tring Museum).

89A. *Automolis buckleyi harterti* subspec. nov. (Pl. VI. fig. 15).

♂. Similar to *buckleyi buckleyi* (Pl. VI. fig. 16), but differs in the forewing being golden yellow instead of orange-salmon, and the parts between the sulphur-yellow costal patches as well as the apical area crimson scarlet.

Hab. Fonte Boa, Amazonas, October 1906 and July 1907 (S. M. Klages).

5 ♂♂.

89B. *Automolis buckleyi whitfordi* subspec. nov.

♂♀. Similar to *buckleyi buckleyi*, but differs in the forewing being pale vermilion, not orange-salmon, and in the black lines bordering the yellow costal patches being much wider and more pronounced.

Hab. British Guiana (bought at Georgetown by Mr. Whitford).

1 ♂, 1 ♀ (2 ♂♂ of *buckleyi buckleyi* in Tring Museum).

90. *Automolis persimilis* spec. nov. (Pl. VI. fig. 25).

♂. At first sight this species would be mistaken for *Idalus flavoplaga* Schaus. Palpi whitish; pectus golden yellow; head yellow, a black spot on frons and behind antennae; tegulae orange golden, with a black spot on each; patagia and thorax striped longitudinally yellow and brown; abdomen: basal three segments above black, yellow at sides, central ones golden yellow, three end ones blue-black, the last with pure white anal tuft.—Forewing mummy-brown, all the

veins strongly buffish yellow; a large wedge-shaped postmedian yellow patch from costa obliquely to vein 5.—Hindwing yellow.

Length of forewing: 17 mm.

Hab. La Oroya, R. Inambari, Carabaya, S.E. Peru, September and October 1904, March, November, and December 1905, and La Union, R. Huacamayo, Carabaya, Peru, December 1904, and Tinguri, Carabaya, August 1904 (G. Ockenden).

20 ♂♂.

90A. *Automolis persimilis marginata* subspec. nov. (Pl. VI. figs. 22, 23).

♂. Similar to *persimilis persimilis*, but hindwing has costal half yellow, rest of wing sooty brown.

♀. Has hindwing yellow, broadly margined with brown.

Hab. Tuis, Costa Rica; Fonte Boa, Amazonas, October 1906 (S. M. Klages).

1 ♂, 2 ♂♂.

91. *Automolis brunnescens* spec. nov. (Pl. VI. fig. 19).

♂. Palpi and legs mummy-brown; head and tegulae creamy white; patagia longitudinally outer half mummy-brown, inner half creamy white; thorax creamy white; abdomen pale orange, last segment buff.—Forewing mummy-brown with pale whitish dot beyond cell; in some specimens this is a distinct spot, in others hardly visible.—Hindwing: costal two-fifths buff, along inner margin orange yellow, outer two-fifths sooty brown.

♀. Larger entire hindwings sooty grey-brown.

Length of forewing: ♂, 21 mm.; ♀, 25 mm.

Hab. Fonte Boa, Amazonas, July and August 1907 (S. M. Klages).

10 ♂♂, 1 ♀.

91A. *Automolis brunnescens unicolor* subspec. nov. (Pl. VI. fig. 10).

♂. Differs from *brunnescens brunnescens* by the palpi, head, legs, and thorax being uniform brown and the forewing without the central whitish spot.

Hab. Buenavista, East Bolivia, August 1906 (J. Steinbach).

1 ♂.

92. *Automolis griseonitens* spec. nov. (Pl. VI. fig. 27).

♂. Nearly allied to *A. angulosa* Walk. Palpi, legs, and pectus black, strongly iridescent with steel-blue; head blue; tegulae orange; patagia black, slightly glossed with steel-blue; thorax bright glittering blue; abdomen, first two segments orange, rest iridescent steel-blue.—Forewing greyish black, strongly iridescent with steel-green; an antemedian transverse orange band as in *angulosa*, but nearly double as wide; the oblique subapical orange band also wider, but farther from apex, so that the dark apical area is larger than in *angulosa*.—Hindwing: basal half buffish orange, outer half brownish steel-blue; all wings broader than in *angulosa* (Pl. VI. fig. 29).

♀. Similar.

Length of forewing: ♂, 22 mm.; ♀, 25 mm.

Hab. La Oroya, R. Inambari, S.E. Peru, March 1905, and Santo Domingo, Carabaya, Peru, October 1902 and January 1903 (G. Ockenden).

2 ♂♂, 1 ♀.

93. *Automolis ardesiaca* spec. nov. (Pl. VI. fig. 28).

♂. Also close to *angulosa* Walk. (Pl. VI. fig. 29). Palpi, pectus, legs, and head dark blackish slate, strongly iridescent with bright blue; tegulae buff; patagia and thorax pale slate-grey with bluish iridescence; abdomen deep iridescent blue, first two segments buff.—Forewing pale slate-grey with bluish green gloss; a broad antemedian transverse and a broad subapical band buff; the latter is so broad that only the bare apex is dark.—Hindwing: basal half buff, outer half brown-grey with bluish gloss.

Length of forewing: ♂, 20 mm.

Hab. Tuis, Costa Rica.

2 ♂♂.

94. *Automolis alboatra* spec. nov. (Pl. VI. fig. 30).

♂. Palpi, basal half orange, apical half blackish brown; pectus orange; legs blackish brown; frons blackish brown; head and collar orange, a black spot between and one behind antennae; tegulae and patagia, longitudinally, inner half brownish black, outer half creamy white; thorax and abdomen above brownish black, sides and last two segments of abdomen orange.—Forewing brownish black, veins 1, 2, and 3 slightly picked out in dull grey, basal half of wing from costa to vein 2 creamy white; in apical third a broad oblique creamy white band, reaching from costa to outer margin.—Hindwing: costal two-thirds creamy white, apex and inner third sooty greyish black.

Length of forewing: 20 mm.

Hab. Fonte Boa, Amazonas, July 1906 (S. M. Klages); Rio Demerara; La Union, R. Huacamayo, Carabaya, Peru, November 1904, and La Oroya, R. Inambari, S.E. Peru, March 1905 (G. Ockenden).

4 ♂♂.

95. *Automolis semicostalis* spec. nov. (Pl. VI. fig. 31).

♀. Palpi and legs sooty brown; head orange, a black dot behind antennae; tegulae and patagia, longitudinally, outer half white, inner half sooty brown; thorax and abdomen sooty brown, four lateral orange spots on each side, one on each side of segments 4, 5, 6, and 7.—Forewing sooty brown, basal half of costa creamy white, a subapical oblique broad band of pure white from costa to outer margin.—Hindwing sooty brown, a whitish patch on basal half of costal area.

♂. Similar.

Length of forewing: 20 mm.

Hab. Fonte Boa, Amazonas, October 1906 (S. M. Klages); Paramaribo, December 1892 (C. W. Ellacombe).

1 ♂, 1 ♀.

95A. *Automolis semicostalis apicalis* subspec. nov.

♀. Similar to *semicostalis semicostalis*, but whole apical two-fifths of forewing white. This may prove a distinct species, bearing the same relationship to *semicostalis* that *godmani* does to *rutilus*; but the unique specimen is too damaged to decide.

Hab. Ten miles above Mapiri, Bolivia, 2000 ft., 1895 (Maxwell Stuart).

1 ♀.

96. **Automolis packardi saturata** subsp. nov. (Pl. VI. fig. 33).

♂ ♀. Similar to *packardi packardi* (Pl. VI. fig. 32), but much larger, the brown much deeper and richer, and all orange markings narrower.

Hab. Rio Demerara, British Guiana; Sta. Catharina, Brazil.

1 ♂, 2 ♀ ♀.

This may be a distinct species.

97. **Automolis underwoodi** spec. nov. (Pl. VI. fig. 34).

♂. Similar to *A. pratti*, but at once recognisable in the forewing by the basal two-thirds of costa being orange yellow and the longitudinal orange-yellow band being much wider, half filling cell. No fuscous cilia.—Hindwing more extended yellow.

Hab. Costa Rica (Underwood).

98. **Automolis rosenbergi** spec. nov. (Pl. VI. fig. 35).

♂ ♀. Very similar to *A. collateralis*, but no yellow on costa and the central longitudinal band of forewing much narrower and curved downwards near apex, and it does not reach outer margin.

Hab. Paramba, Ecuador, 3500 ft., March 1897 (W. F. Rosenberg); Hacienda Ave Maria, West Ecuador (Buchwald); Tachira, Venezuela (Briceño).

3 ♂♂, 5 ♀♀.

99A. **Automolis vitrea borealis** subsp. nov. (Pl. VII. fig. 3).

♂ ♀. Resembles *vitrea vitrea*, but differs by having the black markings in basal half of forewing much reduced and wider apart, the paler lines cinnamon-yellow instead of brown, the dark markings on thorax much paler and the light ones orange-salmon, not brown, the submarginal row of black spots on forewing generally complete, consisting of five spots instead of one to three, hindwing yellowish salmon-pink instead of yellow-buff, and by the last two segments of abdomen being orange, **not** black.

Hab. Orizaba, Mexico, January to April (W. Schaus); Ciudad de Guatemala (Rodriguez); Huatuxco, Vera Cruz; Costa Rica (Underwood); Rosary Mine, Spanish Honduras.

8 ♂♂, 5 ♀♀.

99B. **Automolis vitrea occidentalis** subsp. nov. (Pl. VII. fig. 4).

♂. Differs from *vitrea vitrea* (Pl. VII. fig. 2) in having the lighter portions of the basal half of forewing chestnut, in the costal half rosy, in the inner half and hindwing washed with deep salmon; the abdomen is orange-rufous.

Hab. La Union, R. Huacamayo, Carabaya, Peru, November 1904 (G. Ockenden).

6 ♂♂.

99c. **Automolis vitrea meridionalis** subsp. nov. (Pl. VII. fig. 1).

♂. Has the black streaks in basal half of forewing almost obsolete, and the pink spread over basal third of the wing.

Hab. Sapucay, Paraguay, June 1902 (W. Foster); S. Brazil.

2 ♂♂.

100. *Automolis intermedia* spec. nov. (Pl. VI. fig. 37).

♂. This species forms the connecting link between *A. vitrea* and *A. tybris*. Palpi grey; head and legs white; tegulae white with two brownish streaks on the outer edge; patagia and thorax white, with brownish yellow edges; abdomen dull yellow, a white dorsal spot on each of the three first segments.—Forewing hyaline white, basal half with some irregular semi-obliterated blackish streaks; at end of cell a brown ocellated spot; from angle of inner margin (tornus) runs a brown streak for about 3 mm.; above this on disc are a few pale grey dots and a brown spot between veins 6 and 7 near outer margin.—Hindwing hyaline white, yellow from inner margin to vein 2.

Length of forewing: 20 mm.

Hab. La Union, R. Huacamayo, Carabaya, Peru, November 1904 (G. Ockenden).

2 ♂♂.

101. *Automolis reticulata* spec. nov. (Pl. VI. fig. 38).

♂. Palpi and tibiae of forelegs brown-grey; tarsi and remaining legs white; head, thorax, and abdomen earthy brown with paler reticulations.—Forewing: basal third earthy brown, reticulated with yellow spots, apical two-thirds yellowish hyaline with an irregular broad postmedian band and reticulations of earthy brown.—Hindwing hyaline white, a large brown patch at apex.

Length of forewing: 17 mm.

Hab. Fonte Boa, Amazonas, July 1906 (S. M. Klages).

1 ♂.

102. *Castrica sordidior* spec. nov. (Pl. VII. fig. 5).

♂. This species has the forewing much less truncate, more pointed, and the hindwing rounder, less angulated; the pectus is orange, not lemon-yellow; the thorax olive-green, not bright olive-yellow; abdomen black-brown, not yellow, last segment olive-yellow.—The forewing has the olive-green areas much darker and the hyaline areas much reduced by increased olive-green markings; the inner marginal area yellowish green, not yellow.—Hindwing olive-grey, not yellow.

Hab. Caparo, Trinidad, November 1905, and Fonte Boa, Amazonas, May 1906 (S. M. Klages).

4 ♂♂.

103. *Melesse peruviana* spec. nov. (Pl. VII. figs. 7, 8).

♀. This species is nearest to *M. laodamia* Drnce (Pl. VII. fig. 10). The whole forewing is, however, purplish grey-brown, and there are in basal half a number of yellow spots enclosed in crimson scarlet rings; a similar spot in cell; outer margin from apex to vein 3 yellow as in *laodamia*, but the scarlet inner line runs into the yellow in a number of conical points; postmedian yellow; costal patch larger, more quadrate, and hardly produced towards apex.

♂. Almost identical, but the spots on basal half of forewing larger.

Length of forewing: ♀ 23 mm.; ♂ 18 mm.

Hab. Santo Domingo, Carabaya, Peru, November 1901, July, October, December 1902, September 1904, and March 1905 (G. Ockenden).

19 ♂♂, 2 ♀♀.

104. *Melesse klagesi* spec. nov. (Pl. VII. fig. 11).

♀. Closely allied to *M. babosa* Dognin (Pl. VII. fig. 12) and *M. chiriquensis* Schaus. Differs from *babosa* in the black spots in and around apex of cell of forewing being larger and very distinct, somewhat ocellate; the postmedian hyaline patch consists of a central linear oblong streak and the upper and lower spots reduced to dots, while in *babosa* the upper and central spots are large and irregular in shape, and the lower one only is a dot.—Hindwing sooty grey, black instead of pale grey; abdomen bright crimson instead of pale pinkish crimson.

Length of forewing: 13 mm.

Hab. Aroewarwa Creek, Maroewym Valley, Surinam, March 1905 (S. M. Klages).

2 ♀ ♀.

105. *Melesse flavipuncta* spec. nov. (Pl. VII. figs. 13, 14).

♂. Palpi pale crimson; head cinnamon-brown; base of antennae and collar pale crimson; thorax cinnamon-brown; abdomen rosy crimson.—Forewing cinnamon-brown, apical portion of costal margin and the outer margin rosy crimson; a subbasal round black spot, a half-obliterated darker median band and a dark patch at end of cell; about one-third from the base on vein 1 is a round spot; upper half yellow, lower half orange.—Hindwing rosy crimson.

♀. Larger and rather paler.

Length of forewing: ♂ 15 mm.; ♀ 19 mm.

Hab. Caparo, Trinidad, November 1905 (S. M. Klages), type; Qnevedo, W. Ecuador (v. Buchwald); La Union, R. Hnacamayo, Carabaya, Peru, December 1904 (G. Ockenden); Aroewarwa Creek, Maroewym Valley, Surinam, April 1905 (S. M. Klages); Sta. Catharina, Brazil; Fonte Boa, Amazonas, October 1906 (S. M. Klages); Buenavista, East Bolivia, August 1906 (J. Steinbach); Paramaribo, July 1892; S. Javier, R. Cachabi, Ecuador (Flemming & Miquetta).

21 ♂ ♂, 13 ♀ ♀.

106. *Melesse quadripunctata* spec. nov. (Pl. VII. fig. 15).

♀. Palpi and head yellowish crimson; thorax cinnamon-brown, variegated with yellowish crimson; abdomen and hindwing pale salmon-pink.—Forewing deep cinnamon-brown; costal and outer margin crimson; at end of cell a crimson dot with dark ring; a similar larger spot between veins 2 and 3 and 3 and 4; on vein 1 is a yellow spot with a crimson ring.

Length of forewing: 20 mm.

Hab. Huancabamba, Cerro de Pasco, 6000—10,000 ft., Peru (Böttger).

1 ♀.

107. *Melesse inconspicua* spec. nov. (Pl. VII. fig. 28).

♀. Head and body pale yellowish grey-brown.—Forewing darker, with five half-obliterated transverse dotted blackish lines.—Hindwing fuscous maize, semihyaline.

Length of forewing: 12 mm.

Hab. Fonte Boa, Amazonas, May 1906 (S. M. Klages).

1 ♀.

108. *Bertholdia ockendeni* spec. nov. (Pl. VII. fig. 16).

♂. Allied to *B. myosticta* Hmps.

Head and thorax rufous tawny; abdomen rosy crimson, last segment black with white tufts.—Forewing orange-tawny, more golden towards inner margin; outer margin uniform dark brown; cilia with whitish dots at end of veins; on vein 1, one-third from base, is a round golden yellow spot.—Hindwing hyaline pinkish white, along inner margin broadly pale carmine.

Length of forewing: 23–25 mm.

Hab. Oconeque, Carabaya, Peru, July 1904 (G. Oekenden).

3 ♂♂, 2 ♀♀.

109. *Bertholdia rubromaculata* spec. nov. (Pl. VII. fig. 17).

♀. Palpi white tipped with crimson; base of antennae crimson; head and thorax greyish cinnamon; abdomen rosy crimson with whitish anal tuft.—Forewing ochraceous cinnamon, more vinaceous in apical third, hyaline patch yellow; a crimson streak at base of inner margin, a white dot on vein 1, and above this dot a large scarlet blotch.—Hindwing hyaline pinkish white, rosy carmine on and beyond inner margin.

♂. Similar.

Length of forewing: ♀ 21 mm.; ♂ 18 mm.

Hab. Oconeque, Carabaya, Peru, July 1904 (G. Oekenden).

3 ♂♂, 1 ♀.

110. *Bertholdia steinbachi* spec. nov. (Pl. VII. fig. 19).

♀. Head and thorax crimson, irrorated with yellowish grey; abdomen crimson.—Forewing: basal two-thirds crimson, washed with yellow towards hyaline patch, outer third vinaceous brown, hyaline patch yellowish; white dot on vein 1.—Hindwing hyaline pinkish white, pale mauve-pink along inner margin.

♂. Similar.

Length of forewing: 20 mm.

Hab. Salta, N. Argentina, and Tucuman (J. Steinbach).

1 ♂, 1 ♀.

111. *Bertholdia grisescens* spec. nov. (Pl. VII. fig. 18).

♀. Palpi white with pink tips; head and thorax pale mouse-grey with narrow yellow edges; abdomen crimson.—Forewing: costal edge in basal third mauve-pink, then along hyaline patch creamy white, then pink to apex, cilia of outer margin grey with pink dots at end of veins; whole wing pale mouse-grey, shaded with darker grey in outer two-thirds; on vein 1 a golden yellow spot, and a similar nearer the base, half way between vein 1 and the costa.—Hindwing hyaline, a wide grey border on outer and costal margins, inner margin crimson, hyaline patch edged with intense black.

♂. Similar.

Length of forewing: ♀ 24 mm.; ♂ 18.5 mm.

Hab. La Oroya, R. Inambari, S.E. Peru, January 1906, and Tinguri, Carabaya, August 1904, and Santo Domingo, Carabaya, December 1902 (G. Oekenden); Salidero, N.W. Ecuador, February 1901 (Flemming & Miquetta); La Merced,

R. Toro, Peru, September 1901 (Simons); Sapucay, Paraguay, January 9, 1905, and December 31, 1904 (W. Foster); Columbia, R. Cayapas, N.W. Ecuador (Flemming & Miquetta).

14 ♀♀, 17 ♂♂.

112. *Prumala intensa* spec. nov. (Pl. IV. fig. 19).

♂♀. Very close to *P. hieroglyphica* Schaus, but the markings much more intense. The red markings of forewings much more intense and larger, the subapical oblique brown line of *hieroglyphica* replaced in *intensa* by a broad deep brown band, and the inner margin more than twice as wide as in *hieroglyphica* and deep brown.

Hab. Fonte Boa, Amazonas, May—August 1907 (S. M. Klages).

1 ♂, 1 ♀, in Tring Museum.

113. *Hyponerita sardanapalus* spec. nov. (Pl. VII. fig. 21).

♀. Palpi and head crimson; a yellow patch on vertex; thorax and forewing brilliant deep crimson, strongly washed with iridescent plum purple; apical two-thirds of costa and outer margin to vein 2 yellow, a median triangular costal patch also yellow.—Hindwing salmon-buff; abdomen scarlet dorsally, buff laterally.

♂. Similar, but hindwing yellow buff.

Length of forewing: 13.5 mm.

Hab. La Union, R. Huacamayo, Carabaya, Peru, December 1904 (G. Ockenden); Fonte Boa, Amazonas, May 1906 (S. M. Klages).

3 ♂♂, 5 ♀♀.

114. *Hyponerita grandis* spec. nov. (Pl. VII. fig. 20).

♂♀. Similar to *H. incerta* Schaus, but much larger. Palpi, head, and legs pale yellow; thorax deep mummy-brown; abdomen crimson.—Forewing deep mummy-brown; apical two-thirds of costal edge yellow, a large median irregular triangular costal patch yellow, a subapical smaller one, and the outer margin from vein 10 to vein 1 irregularly yellow.—Hindwing hyaline buff.

Length of forewing: ♀ 20 mm.; ♂ 16 mm.

Hab. Santo Domingo, Carabaya, Peru, November 1902 (G. Ockenden).

2 ♂♂, 6 ♀♀.

115. *Paranerita klagesi* spec. nov. (Pl. VII. fig. 22).

♂♀. Near to *P. metapyria* Dognin (Pl. VII. fig. 23).

Differs at first sight from *metapyria* by its abruptly truncate and pointed forewing; the subapical mauve patch is square, not ovate, and is joined to the oblique basal half of wing by a broad mauve band; a white patch and yellow dot in basal third of forewing; thorax blackish mauve instead of pale pinkish lavender.

Length of forewing: ♂ 15 mm.; ♀ 17 mm.

Hab. Fonte Boa, Amazonas, August 1906 (S. M. Klages).

1 ♂, 1 ♀.

116. *Pseudalus leos occidentalis* subsp. nov. (Pl. VII. fig. 27).

♂. Similar to *leos leos*, but the oblique line from middle of inner margin to just before apex is not broken up into dots, the spot in cell is larger and the wing more pointed.

Hab. Tinguri, Carabaya, August 1904, and La Oroya, R. Inambari, S.E. Peru, March 1905 (G. Ockenden).

2 ♂♂.

117. *Pseudalus aurantiacus* spec. nov. (Pl. VII. figs. 25, 26).

♂. Palpi, legs, head, thorax, and abdomen orange-yellow.—Forewing yellow, strongly suffused with rufous orange; an antemedian and postmedian oblique deep rufous brown line across the wing from costa to inner margin.—Hindwing pale salmon.

♀. Resembles *P. leos leos*, but the postmedian band is integral and strongly marked, the antemedian unbroken and straighter, and the forewing is shorter and rounder.

Length of forewing: ♂ 12 mm.; ♀ 18 mm.

Hab. Aroewarwa Creek, Maroewym Valley, Surinam, April 1905 (S. M. Klages).

6 ♂♂, 1 ♀.

118. *Pseudalus strigatus* spec. nov. (Pl. VII. fig. 24).

♂♀. Palpi and legs orange; head yellow; tegulae yellow; patagia and thorax yellow, streaked with orange; abdomen orange.—Forewing yellow with broad orange stripes between the veins and on costa; a broad streak of orange-scarlet along inner margin; an antemedian and a postmedian deep brown oblique line, black where crossing veins from costa to inner margin, both angulated on and below costa.

Length of forewing: ♂ 17 mm.; ♀ 20 mm.

Hab. Tinguri, Carabaya, Peru, August 1904, and La Oroya, R. Inambari, S.E. Peru, September 1904 (G. Ockenden).

2 ♂♂, 1 ♀.

119. *Praemolis schausi* spec. nov. (Pl. IV. fig. 23).

♂. Nearly allied to *P. amargyllis* Schaus, but differs from it by having a well-defined fuscous median transverse band on forewing, and a greater number of and more distinct red zigzag lines across the forewing, and the postmedian fuscous band is much wider.

Length of forewing: 15 mm.

Hab. Fonte Boa, Amazonas, August 1906 (S. M. Klages).

1 ♂.

SOME NEW SIPHONAPTERA.

By THE HON. N. CHARLES ROTHSCHILD, M.A., F.E.S.

1. *Loemopsylla vigetus* spec. nov. (Pl. VIII. fig. 3, 4).

A CLOSE ally of *L. scopulifer* Rothschild, *Nor. Zool.* xii. p. 480. n. 2. t. 13. fig. 5 (1905) (South and South-East Africa), and *L. tortus* Rothschild, *Parasitology* i. p. 53. n. 14. t. 5. fig. 4 (1908) (South-East Africa), but nearer to the former. The bristles are fewer in number and on the whole slenderer than in the two species mentioned. The first row on the epimerum of the metathorax contains 5 or 6 bristles, and the second row 4 to 6. The third and fourth abdominal tergites have each a row of 13 to 15 bristles on the two sides together. The numbers of the bristles on the sternites of segments 3 to 7 are as follows: ♂, 5-7, 6, 6, 6, 6; ♀, 8-10, 8-9, 8, 7-9, 7-11. The sternite of the seventh segment has in front of the row, on each side, a single bristle, which is sometimes absent. The hindfemur has 2 subapical ventral bristles on the outer side and a row of 5 or 6, rarely 4, on the inside. The bristles on the tibiae and the tarsi are less stout than in *scopulifer*, but of about the same length as in that species. The short subapical bristle situated on the posterior side of the foretibia deserves special mention as being decidedly thinner than the corresponding bristle in *scopulifer*.

Modified Segments.—♂. The eighth sternite bears laterally one, rarely two, long bristles near the base, and ventrally from 6 to 8 bristles, of which the most distal one is the longest; these bristles are arranged in four rows as follows: 2 or 3, 2 or 3, 1 or 2, 1. The outer flap of the clasper bears 7 bristles, of which the third is the thickest, while the fourth is the longest, being curved and twisted as in the allied species (Pl. VIII. fig. 3. F¹). These bristles are shorter than the corresponding bristles in *scopulifer*, and the third is much thicker than in *tortus*. The inner flap of the clasper (Pl. VIII. fig. 3. F²) is less curved than in *tortus*, but much more so than in *scopulifer*; it is also more pointed than in the latter species. The ninth sternite is somewhat club-shaped in lateral aspect (Pl. VIII. fig. 3. ix. st.), the tip being distinctly widened and rounded off. The posterior edge of the ninth tergite bears on each side three bristles as in the allied species, but these bristles are even shorter and thinner than those in *scopulifer*.—♀. The eighth tergite (Pl. VIII. fig. 4) bears on the sides 6 to 8 bristles, an apical row of 8 to 10 (usually 9) bristles on the outside, and an apical row of 7 or 8 (usually 8) on the inside. The bristles on the anal segment are thinner than in the allied species.

We have a series of both sexes off "rats" collected by Dr. Kennan at Freetown, Sierra Leone; received from Dr. G. H. F. Nuttall.

2. *Ceratophyllus enoplus* spec. nov. (Pl. VIII. fig. 6).

Near *C. leucopus* Baker, *Proc. U.S. Nat. Mus.* xxvii. p. 401 (1904), which we know only from the description.

Head.—The frons bears a row of 3 long bristles in front of the eye; further upwards there are 3 or 4 small bristles, and between these and the eye a number

of small hairs. The occiput bears one rather short and thin bristle laterally above the antennal groove. The bristle which is situated at the ventral angle of the occiput is very long, and is not accompanied by a second bristle, as is the case in *leucopus*. The rostrum reaches to the apex of the trochanter, while in *leucopus*, according to Baker, it extends only four-fifths the length of the coxa.

Thorax.—The pronotum bears a comb of 19 spines, the ventral spine on each side being short and narrow. The meso- and metanota have each two rows of bristles as in *leucopus*; and the mesonotum bears in addition a row of numerous small hairs at the basal edge and 6 or 7 long slender spines on each side in front of the apex. The epimerum of the metathorax has about 7 bristles (3, 3, 1), which are rather irregularly arranged.

Abdomen.—The abdominal tergites, including the first, have each two rows of bristles. The seventh tergite has one long and one shorter apical bristle, the long one being only a little shorter than the first hindtarsal segment. The sternites of the third to seventh segments have each 3 bristles on each side, while the basal sternite bears one lateral and one ventral bristle on each side.

Legs.—The bristles on the tibiae and tarsi are less numerous than in *C. keeni* Baker (1896), the first hindtarsal segment bearing only 7 pairs on the hinder side. The longest apical bristle of the second hindtarsal segment reaches to the apex of the third segment. The proportions of the segments of the midtarsus are: 20, 17, 13, 9, 20, and of the hindtarsus, 48, 30, 21, 11, 23.

Modified Segments.—♂. Similar to those of *C. keeni*; but quite distinct. The eighth tergite bears a row of 8 long bristles on the upper portion of the dorsal edge, and about 20 along the lower edge, all these bristles being slender and some of them very long. The movable process of the clasper is broader than in *keeni*, and bears two short thick spines, and at the apex a long bristle, as shown in the figure (Pl. VIII. fig. 6); the upper of these spines ends in a short point. The ninth sternite bears very numerous small hairs along the ventral edge and on the outer surface. The anal segment is very long.

Length: 2.3 mm.

We have one ♂ off Californian Grey Squirrel, collected at King's River, California, on July 25, 1896; received from Dr. G. H. F. Nuttall.

3. *Ceratophyllus ponerus* spec. nov. (Pl. VIII. fig. 5).

Nearest to *C. asio* Baker, *Proc. U.S. Nat. Mus.* xxvii. p. 406 (1904). Only one ♀ known.

Head.—The frons bears two rows of bristles as in *C. asio*, and the occiput an oblique lateral row also as in that species. The first segment of the antenna bears numerous small hairs all over.

Thorax.—The pronotum has a comb of 24 spines. The mesonotum has one row of long bristles and three rows of short ones, in addition to numerous bristles situated at the basal edge, and another row of slender spines in front of the apex. The metanotum has an apical spine on each side, in this respect resembling the first to sixth abdominal tergites. The epimerum of the metathorax is furnished with 12 to 14 bristles arranged in four rows (3, 4 or 5, 4 or 5, 1).

Abdomen.—The seventh tergite bears 3 antepygial bristles, the middle one being very long and surpassing in length the first segment of the hindtarsus. The basal sternite bears a lateral patch of small hairs, besides some small

ventral hairs and a ventral pair of bristles. The stylet is cylindrical, tapers at the tip, and is about four times as long as it is broad. The anal tergite is densely hairy.

Legs.—The hindcoxa bears posteriorly 3 subapical bristles. The hindfemur has 2 bristles on the outer side near the apex, and 1 on the inner side. The hindtibia bears on the outer surface two rows of about 15 bristles in all, and 2 or 3 bristles on the inner surface. Two of the apical bristles of the second hindtarsal segment extend beyond the third segment, and the longest one even reaches to the apex of the fourth segment. The longest apical bristle of the first segment reaches the apex of the second. The proportions of the segments are in the midtarsus 27, 20, 13, 8, 18, and in the hindtarsus 47, 27, 15, 10, 19.

Modified Segments.—The seventh sternite bears no sinus. The eighth tergite (Pl. VIII. fig. 5) has 6 long bristles along the ventral and apical margins, of which the third and fifth are the shortest; above the fourth and fifth of these bristles there is a patch of 9 short but stout bristles. Just below the stigma there are 2 very long bristles, and farther down 1 somewhat shorter one.

Length : 2.7 mm.

We have one ♀ off "Fox," collected at Palo Alto, California, in July 1895; received from Dr. G. H. F. Nuttall.

4. *Ischnopsyllus scitulus* spec. nov. (Pl. VIII. figs. 1, 2).

Nearest to *I. aegyptius* Rothsch., *Ent. Mo. Mag.* (2) xiv. p. 83. t. 1. fig. 1 (1903) (Cairo),* but abundantly distinct. We know only the ♂ of the new species. The dorsal parts of the occiput, the thorax, and the abdomen are strongly chitinated.

Head.—Resembles the head of *aegyptius*, but the bristles are very much stronger (Pl. VIII. fig. 1). The frontal portion bears a row of short bristles parallel to the frontal outline, as in *aegyptius*. The genal process is strongly chitinated, its colour being in parts brownish black. This black portion surrounds at the antennal groove an elongated transparent space which is probably a vestigial eye. Above this space there is a very strong curved bristle, and higher up a number of smaller bristles. The genal process ends in a small point. The occiput bears above the antennal groove a row of about 10 stout bristles, of which the lowest three or four are placed close together at the lower posterior angle of the head. On the sides of the occiput there are three transverse rows of stout bristles besides the apical row, each of these transverse rows containing 2 or 3 stout lateral bristles, there being moreover several small dorsal bristles. The first segment of the antenna is longer than the club. The first segment of the maxillary palpus is the longest, while the second and the fourth are of equal length, and the third is the shortest. The rostrum does not reach to the apex of the maxillary palpus; the fourth segment of the rostrum is nearly as long as the first three together, and the fifth only about as long as it is broad.

Thorax.—The pronotum has a comb of 22 spines, and bears, besides the usual postmedian row of bristles, several rather stout hairs further frontad. The

* Oudemans in *Tijdschr. Ent.* p. 102 (1908) proposes the genus *Chiropteropsylla* for the reception of *I. aegyptius*, characterising this "genus" by the possession of a kind of comb on the epimerum of the metathorax and the small size of the first abdominal tergite. This comb is absent from the new species.

mesonotum bears numerous hairs at the base, and dorsally 5 transverse rows of stout short bristles, each row containing from 4 to 6 such bristles. As in *aegyptius*, the epimerum of the mesothorax rapidly narrows posteriorly and the stigma is not covered. The metanotum is also shaped like that of *aegyptius*. It bears a subapical row of 6 stout bristles on the two sides together, and 4 or 5 rows of shorter ones, all of which are restricted to the dorsal heavily chitinated portion of the metanotum. The epimerum of the metathorax has one stout bristle at the apex and a second one close to it, as well as about 5 shorter and thinner bristles on the side.

Abdomen.—The first abdominal tergite bears two rows of about 6 bristles each on the two sides together. The second to seventh tergites have each a bristle beneath the stigma and another above the stigma, these bristles being separated by a wide interspace from the dorsal portion of the row to which they belong. The first and second abdominal tergites, like the metanotum, bear two dorsal apical spines. The seventh tergite has one long apical bristle on each side, accompanied by two small hairs.

Legs.—The first foretarsal segment is only one-third longer than it is broad. The proportions of the segments are in the midtarsus: 24, 21, 14, 9, 18, and in the hindtarsus, 35, 25, 16, 10, 20.

Modified Segments.—♂. The eighth sternite is triangular in lateral view. The eighth tergite (Pl. VIII. fig. 2) bears 6 bristles at the upper edge posteriorly to the very large stigma, and two on each side. The movable process of the clasper is feebly incurved on the proximal side and slightly rounded distally; the distal side bears a row of minute hairs. The apex of the penis is apically produced into a slender hook, while the apical margin bears a tooth further down, as shown in the figure.

We have two ♂♂ of *Nyctinomus aegyptiacus*, collected by the Rev. Robert Godfrey, at King William's Town, South Africa, on September 25, 1908; received from J. Waterston.

NOTES ON FLEAS IN THE K. K. Hofmuseum in Vienna.

By THE HON. N. CHARLES ROTHSCHILD, M.A., F.E.S.

(Plate IX.)

1. *Echidnophaga ambulans* Olliff.*Echidnophaga ambulans* Olliff, *Proc. Linn. Soc. N. S. Wales* (2), i. p. 172 (1886) (N. S. Wales, off *Echidna hystrix*).

THERE are a number of females in the collection of the K. K. Hofmuseum which belong to a species not known to us when we published the "Revision of the *Sarcopsyllidae*" in the *Thompson, Yates, and Johnston Laboratories Report*, vii. (1906). This insect, we think, is the true *E. ambulans*. Mr. W. J. Rainbow has kindly sent us a sketch of the tarsi of the type-specimen of *E. ambulans* which proves that *ambulans* has two ventral apical bristles on the fifth tarsal segment like *gallinaceus*, and that this segment bears on each side two strong bristles and one thin one. The Vienna specimens, taken off *Echidna hystrix*, show the same character, and doubtless are the true *ambulans*. We give a figure of the fifth segment of the midtarsus on Pl. IX. fig. 9.

2. *Echidnophaga myrmecobii* spec. nov. (Waterhouse indescr.).*Sarcopsylla myrmecobii* Waterhouse, *Proc. Ent. Soc. Lond.* p. 23 (1887) (nom. nudum, West Australia, off *Myrmecobius*).*Echidnophaga ambulans*, Rothsch. & Jord. (see Olliff, err. determ.), *Thomps., Yates & Johnston. Labor. Rept.* vii. p. 54. n. 6 (1906) (N. S. Wales, Victoria, W. Austr., off *Trichosurus vulpecula*, *Bettongia lesueuri*, *Diamenia superciliosa*, *Myrmecobius fasciatus*, *Paragale lagotis*).

This insect was erroneously identified by us as *ambulans* (see above). We accept for it the name introduced by Mr. Waterhouse, making our ♂ off *Trichosurus* from Sydney the "type."

E. myrmecobii agrees very closely with *E. gallinaceus*, differing from the latter in having only one ventral apical bristle on the fifth tarsal segment instead of two.

3. *Ceratophyllus flaveolus* spec. nov. (Pl. IX. fig. 6.)

Allied to *C. gallinae* Schrank (1804); smaller and much paler. Only one ♀ known.

Head.—The frons bears 3 bristles in front of the eye and a row of 4 smaller ones before them. On the occiput there is one bristle behind the base of the antenna and two more above the middle of the antennal groove, besides the usual subapical row.

Thorax.—The comb of the pronotum consists of 32 spines.

Abdomen.—The tergites bear two rows of bristles and a few additional hairs in front of the rows, the number of bristles being on the first tergite 15 in the anterior and 13 in the posterior row, the second tergite bearing 19 bristles in each row. The first sternite has 7 bristles on each side, the following four sternites each bearing a row of 5 to 8 bristles on each side and 5 to 10 bristles in front of the row. The sternite of the seventh segment has a row of 8, in front of which there are more than 20 bristles. The antepygial bristles are longer than in *gallinae*, and the central one of these bristles is only a little over twice the

length of the other two. The seventh sternite (Pl. IX. fig. 6) is produced into a pointed lobe, as shown in the figure.

Legs.—The hindfemur has a row of 8 bristles on the inside, and the hindtibia about 18 bristles on the outer surface exclusive of the bristles situated at the apex, the inside bearing a row of 8 or 9 bristles.

Modified Segments.—The eighth tergite (Pl. IX. fig. 6) bears about 20 long and 14 shorter bristles on the outer surface, 3 or 4 long ones being placed beneath the stigma. The stylet is shorter than in *gallinae*, the two lateral bristles being placed a very little beyond half-way between the base and the apex.

One ♀ off *Mustela erminea*, collected by von Frauentfeld, probably in the neighbourhood of Vienna. The occurrence of this insect on *Mustela* is doubtless accidental, as the species is a true bird-flea.

4. *Ceratophyllus phaulius* spec. nov. (Pl. IX. fig. 8).

Likewise a bird-flea. There is in the collection only one very pale and apparently immature ♀, which moreover is imperfect. The specimen exhibits some interesting distinctions, and we therefore do not hesitate to describe it.

Head.—The frons bears two rows of bristles. The posterior row, which is placed in front of the eye, contains 3 bristles, of which the central one is the shortest, while the anterior row consists of 5 short thin bristles. The occiput has no bristle behind the base of the antennal groove, but one long one and a short one above the centre of the groove. The long ventral bristle of the subapical row is separated from the bristle situated above it by a wide interspace. Below this ventral bristle there is a short slender one.

Thorax.—The pronotal comb consists of 28 spines.

Abdomen.—The first and fourth tergite bear on each side 2 slender pale apical spines. There are 3 antepygial bristles on the seventh tergite, the middle one being long and the other two very short. The basal sternite has one ventral bristle on each side, the following three sternites bearing 3 bristles, and the sternite of the sixth segment 4 or 5 on each side. The sternite of the seventh segment has the apical edge unfortunately torn on both sides, so that it is impossible to describe the outline. This sternite bears a row of about 6 bristles, and in front of the row about 7 more bristles on each side.

Legs.—The hindfemur bears a row of 6 bristles on the inside and one subbasal and one subapical bristle on the outside.

Modified Segments.—The eighth tergite (Pl. IX. fig. 8) bears 4 long bristles at the apical margin and about 10 moderately long and 12 short ones on the lower portion of the outer surface, there being also several bristles below the stigma (not shown in the figure). Inside the eighth tergite lies the ninth sternite, which in this species bears more bristles at its edge than in any other species we are acquainted with (cf. fig. 8, ix. st.).

We have one ♀ found in the nest of *Cotile riparia* at Stockerau, Lower Austria, by Herr Bernhauer. There was also a ♀ of *Ceratophyllus dalei* in the same tube, and the occurrence on *Cotile* is no doubt accidental.

5. *Ceratophyllus frontalis* spec. nov. (Pl. IX. figs. 1—5).

A very dark species, which is unlike any other described *Ceratophyllus*.

Head.—The frons bears a very strong tubercle in both sexes (Pl. IX. figs. 1, 2) and two rows of bristles as shown in the figure. The occiput has three rows of

bristles inclusive of the subapical row, the anterior row containing less bristles in the ♀ than in the ♂. The rostrum does not reach to the apex of the forecoxa.

Thorax.—The pronotum has a comb of 32–34 spines. The meso- and metanotum are very hairy, bearing three or four irregular rows of short bristles in front of the postmedian row of long bristles. The epimerum of the metathorax has 10 to 12 long bristles and a few minute hairs.

Abdomen.—The tergites are dorsally minutely denticulate, like the thoracic tergites, the four first tergites bearing moreover some apical spines, like the metanotum. They bear three rows of bristles, the first tergite having some additional bristles in front. There are 3 antepygial bristles on the seventh tergite. The middle one of these bristles is long, the other two being short in the ♂, while in the ♀ the upper is short and the lower one two-thirds the length of the central bristle. The basal sternite has a patch of bristles on the lateral surface and several bristles along the ventral margin. The sternites of segments three to six bear on each side a row of 3 or 4 in the ♂, and 6 or 7 in the ♀, besides a number of small hairs in front of the row. The seventh sternite of the ♀ is very deeply sinuate, recalling *C. gallinulae* Dale (= *newsteadii* Rothsch.); cf. Pl. IX. fig. 4.

Legs.—The hindfemur has a row of 7 or 8 bristles on the outer surface, besides some subapical lateral bristles, and a row of 6 bristles on the inner side. The mid- and hind-tibiae bear four more or less irregular rows of bristles on the outer surface. The tibiae and tarsi resemble those of *C. styx* Rothsch.

Modified Segments.—♂. The eighth tergite is smaller than in other bird-fleas and the sternite much larger. This tergite is produced behind the stigma into a rounded lobe, which bears about 6 very long bristles, and at the apex about 5 additional smaller ones. The eighth sternite (Pl. IX. fig. 5) is rounded and is densely covered with numerous bristles. The process of the clasper is broad and at the apex rounded (Pl. IX. fig. 4, r). The movable process is very large (Pl. IX. fig. 4, f), being broadest at the apex. It bears a short stout spine at the upper distal angle on the inside. The ninth sternite is long and slender, and lies concealed in the eighth sternite.—♀. The eighth tergite bears about 12 small bristles above the stigma on each side, about 9 small and 6 long ones beneath the stigma, and between this patch and the ventral margin about 10 large and 24 small bristles. The inner surface of this segment bears some 5 short and stout bristles. The apical edge is short and bisinuate. The stylet resembles that of *gallinae* in bearing the two lateral bristles in the apical fourth.

Length: ♂ 3, ♀ 3.4 mm.

A long series of both sexes taken from the nest of the Alpine Chough (*Pyrrhocorax alpinus*), no locality being mentioned.

6. *Ceratophyllus dalei* Rothsch. (1903).

C. d. Rothsch., *Entom.* xxxvi. p. 297. t. 1. fig. 1–3 (1903).

There is a long series of both sexes in the collection obtained by Heger, neither host nor locality being mentioned. Also one ♀ found by Herr Bernhauer in the nest of *Cotile riparia* at Stockerau, Lower Austria.

7. *Ceratophyllus turbidus* spec. nov. (Pl. IX. fig. 7.)

A single ♀, related to *C. mustelae*.

Head.—The frons has a row of 3 long bristles before the eye, and farther frontad another row of 6 smaller ones. The occiput bears one bristle behind the base of the

antennal groove, and a row of 3 above the centre of the groove, besides the subapical row of 6. The bristles of the second segment of the antennae are much shorter than the club. The rostrum does not quite reach to the apex of the forecoxa.

Thorax.—The comb of the pronotum contains 20 or 21 spines. The epimerum of the metathorax bears 7 or 8 bristles (3 or 4, 3, 1).

Abdomen.—The tergites have each two rows of bristles, the first tergite bearing a few additional bristles in front. There are 3 antepygial bristles on the seventh tergite, the middle one being long. The basal sternite has one ventral bristle on each side. The sternites of segments three to six have a row of 3 or 4 on each side, with one or two small bristles in front. The seventh sternite (Pl. IX. fig. 7) is bilobate, as shown in the figure, and bears a row of 5 or 6 bristles with about 5 smaller bristles in front.

Legs.—The hindfemur has but one lateral bristle on the in- and the outside, this bristle standing near the base, there being a subventral subapical bristle on both surfaces. The hindtibia has 12 bristles on the outer side arranged in two rows, besides some ventral bristles. The longest apical bristles of the first and second hindtarsal segments do not reach the apex of the second and third segments respectively.

Modified Segments.—♀. The eighth tergite (Pl. IX. fig. 7) bears 2 long bristles beneath the stigma, 4 long ones at the apical edge, 3 more above the ventral margin, and 1 long and 3 or 4 short ones on the lower portion of the lateral surface. The stylet is a little over twice as long as it is broad. The ninth (internal) sternite bears apparently only one short bristle.

One ♀ without host and locality, but doubtless from Austria.

8. *Goniopsyllus kerguelensis* Taschenb.

Pulex kerguelensis Taschenberg, *Notes Leyden Mus.* i. p. 169 (1880); id., *Die Flöhe* pp. 67 and 123. t. 2. fig. 12. ♀ (1880) (Kerguelen, off *Pelecanoides urinatrix*).

Goniopsyllus kerguelensis Baker, *Proc. U. S. Nat. Mus.* xxix. p. 128 (1905); Jord. & Rothsch., *Parasitology* i. p. 93. t. 4. fig. 2, t. 7. fig. 11 (1908) (Kerguelen and Antipodes).

The collection of the K. K. Hofmuseum contains a ♀ of this species in good condition, taken off "Sturmvogel" on Kerguelen Island. The specimen agrees with the original ♂ ♀ preserved in the British Museum.

In our paper quoted above we said the ♀ possibly had two receptacula seminis. We now clearly see from the specimen in the Vienna Museum that there is only one receptaculum.

ON SOME AMERICAN, AUSTRALIAN, AND PALEARCTIC
SIPHONAPTERA.

BY THE HON. N. CHARLES ROTHSCILD, M.A., F.E.S.

(Plates X., XI.)

1. *Dermatophilus penetrans* L. (1758).

IN our Revision of the *Sarcopsyllidae* in *Thompson, Yates and Johnston Laborat. Rept.* vii. i. p. 15 (1906), we referred to Oviedo as being the first to have mentioned the Jigger or Chigoe. As Oviedo's work* entitled *Historia General y Natural de las Indias* (1551) is not well known, we give here a copy of what Oviedo says (Lib. II. cap. xiv.) about the Chigoe:

"Hay en esta isla y en todas estas Indias, islas é Tierra-Firme el mal que he dicho de las buas, y otro que llaman de las nignas. Esto de las nignas no es enfermedad, pero es un mal acaso; porque la nigna es una cosa viva é pequeníssima, mucho menor que la menor pulga que se puede ver. Pero en fin es género de pulga, porque assi como ella salta, salvo que es mas pequeña. Este animal anda por el polvo, é donde quiera que quisieren que no le haya, háse de barrer á menudo la casa. Éntrase en los pies y en otras partes de la persona, y en espeçial las mas veces en las cabeças de los dedos, sin que se sienta hasta que estú aposentada entre el cuero é la carne, é comienza á comer de la forma que un arador é harto mas; y despues, quanto mas allí está, mas come. De manera que como acuden las manos rascando, este animal se da tanta priessa á multiplicar allí otros sus semejantes, que en breve tiempo hace muchos; porque luego que entra el primero, se anida é hace una bolsilla entre cuero é carne tamaño como una lenteja, é algunas como garbanço, llena de liendres, las quales todas se tornan nignas. E si con tiempo no se sacan con un alfiler ó aguja, de la forma que se sacan los aradores, son malas; y en espeçial que despues que están criadas (que es quando comiençan mucho á comer), de rascarlas se rompe la carne y despárcense de manera que si no las saben agotar, siempre hay en qué entender. En fin, como en esto tampoco eran diestros los chripstianos, como en el curarse de las buas, muchos perdian los pies por causa de estas nignas, ó á lo menos algunos dedos dellos, porque despues se enconaban é hacían materia, y era nesçessario curarse con hierro ó con fuego. Pero aquesto es fácil de se remediar presto, sacándolas al principio; pero en algunos negros boçales son peligrosas, porque ó por su mala carnadura, ó ser bestiales é no se saber limpiar, ni decirlo con tiempo, vienen á se manear de los pies, é assi otros muchos que se quexan. E yo las he tenido en mis pies en estas islas y en la Tierra-Firme, y no me paresçe que en hombres de raçon es cosa para se temer, aunque es enojo en tanto que tura, ó está la nigna dentro; mas fácil cosa es sacarla al principio. Yo tengo averignado, é assi lo dirán las personas que tienen experiència en sacar estas nignas, que es menester tener aviso, quando las sacan, para las mater; porque alguna vez, assi como con en alfiler ó aguja la descubren, rompiendo el cuero del pie, assi salta y se va la nigna como una pulga. Esto acaesçe si há poco que allí entró; y por esto se cree que la que entra en el pie, despues que ha hecho su mala simiente, se va

* The work is usually quoted as "*Coronica*" (= Cronica, Chronica) instead of *Historia*.

assi como vino á otra parte á hacer mas mal, ó por ventura por si se despidie del pie, despues de haber dexado en él una mala enxambre de innumerable simiente y generacion."

2. *Parapsyllus coxalis* spec. nov. (Pl. X. figs. 1, 2).

A very near ally of *P. cocyti* Rothsch. (1904), but distinguished at once by the peculiar forecoxa.

In both sexes the forecoxa is strongly widened posteriorly near the base (Pl. X. fig. 1), as shown in the figure. It bears a transverse row of slender bristles near the base, and farther down a row of strong bristles. At the hinder edge just below the widest point of the coxa there are two very stout bristles, and between these bristles and the apex of the coxa there is posteriorly only one more bristle, which is placed at some distance from the hind edge.

The fourth tarsal segment, moreover, is shorter than in *P. cocyti*, being twice as broad as it is long in the foretarsus and very little longer than it is broad in the hindtarsus. The fifth tarsal segment also is broader than in *P. cocyti*, being half as long again as it is broad in the foretarsus. The hindfemur bears a row of 7 to 11 bristles on the inside, and the hindtibia 9 to 12 on the outside, which are often arranged in two rows in the ♂. The longest apical bristle of the hindtibia of the ♀ does not extend to the subapical pair of bristles of the first tarsal segment, while in the ♂ this bristle reaches beyond the apex of the first tarsal segment. The first and second hindtarsal segments have 4 very long and slender apical bristles, the longest of the second segment reaching nearly to the tip of the fifth segment (claws excluded).

The genitalia of the ♂ also show some conspicuous differences. The movable process of the clasper is shorter than in *P. cocyti*, and bears a row of 6 or 7 slender hairs along the hinder edge from the base to the apex. The ninth sternite (Pl. X. fig. 2) more nearly resembles that of *P. corfulii* Rothsch. (1904), and is distinguished by bearing numerous hairs at the apex and by the shape of the vertical portion as shown in the figure. The bristles at the apex of the eighth tergite of the ♀ are more numerous than in *P. cocyti*, and the shorter ones stouter.

We have a series of both sexes from Valparaíso, Chile, found by J. S. Wolffsohn on *Octodon degus*.

3. *Parapsyllus australiacus* spec. nov.

Parapsyllus longicornis Jord. & Rothsch. (nec Enderl., err. determ.), *Parasitology* i. p. 85. t. 2. fig. 12, t. 4. fig. 5, t. 7. fig. 3 (1908).

When describing the present insect in the place quoted we said that our specimens did not exactly agree with Enderlein's figures, and might be a closely allied species. Dr. A. C. Oudemans, who has had an opportunity of comparing a cotype of *longicornis* with our insect, now informs us that our identification was indeed erroneous. It therefore becomes necessary to separate our species under a name of its own, and we propose to call it *australiacus*.

We have two pairs taken off *Eudypitula minor* on Bird Island, near Perth, West Australia, by J. Burton Cleland.

4. *Ceratophyllus graphis* spec. nov. (Pl. X. figs. 3, 4).

♂ ♀. In the shape and the bristles of the head somewhat resembles *C. polionis* Rothsch. (1905), but is abundantly distinct.